34th Year JULY, 1950

# RUBBER AGE


## BUTYL EIGHT

*FOR CURING GOODS AT ROOM OR SLIGHTLY ELEVATED TEMPERATURES*

For all self-curing calendered and tubed goods. It may be used effectively in Natural rubber, GR-S and Buna N type rubbers. Accelerates GR-I rapidly at normal curing temperatures.

## SETSIT-5

*ACCELERATOR FOR NATURAL LATEX, GR-S LATEX AND NEOPRENE LATEX*

For highest possible rate of cure at low temperatures. It is liquid — No ball milling required. Easy to use — Dilute with equal volume of water and stir into latex.

**R. T. VANDERBILT CO. INC.**

230 Park Avenue, New York 17, N. Y.

# Du Pont Announces...

## a new flex-resisting antioxidant

# AKROFLEX F*

## efficient and economical

**Comparison of Akroflex F and Thermoflex A**

**Cure for flexing slabs: 45 minutes at 287°F.**

| | |
|---|---|
| Smoked Sheets | 100.0 |
| MPC Carbon Black | 50.0 |
| Stearic Acid | 3.0 |
| Pine Tar | 1.5 |
| Zinc Oxide | 5.0 |
| ZENITE | 1.25 |
| Sulfur | 3.0 |
| Antioxidant | As indicated |

| | Amount and Kind of Antioxidant | | | |
|---|---|---|---|---|
| | —0.5%— | | —1.0%— | |
| | Akroflex F | Thermoflex A | Akroflex F | Thermoflex A |
| **After aging 7 days in 70°C. air oven** | | | | |
| Hours to rating of 1† | 46.7 | 53.9 | 66.8 | 68.7 |
| Hours to rating of 5 | 77.7 | 89.0 | 123.0 | 122.3 |
| **After aging 14 days in 70°C. air oven** | | | | |
| Hours to rating of 1 | 29.4 | 30.1 | 40.7 | 43.9 |
| Hours to rating of 5 | 54.1 | 56.1 | 77.6 | 81.4 |

*†Each figure in this table represents the average time to a given flex rating based upon tests on 27 specimens.*

Akroflex F is a unique new anti-flex cracking antioxidant fortified with a booster. It has important advantages over conventional antioxidants or mixtures of them. In efficiency it is almost equal to Thermoflex A, long the standard of excellence among all flex-resisting antioxidants. It is economical . . . costs one-third less than Thermoflex A. And its melting point is high enough to prevent caking or packing in storage. Yet it is low enough to assure excellent dispersion.

The data in the table, based on results of tests on the Du Pont flexing machine, show the effectiveness of Akroflex F compared with Thermoflex A. A rating of 1 indicates cracking has just started; a rating of 5 denotes moderately severe cracking. For all practical purposes, the two antioxidants proved equally effective. And results on 8.20 x 15 tires, road-tested with "half and half" treads, confirmed that there was essentially no difference in the performance of the two materials.

You will want to try Akroflex F at your first opportunity. Complete information will be found in our recent Report 50-2. Extra copies are available. For samples, see your Du Pont representative or write E. I. du Pont de Nemours & Co. (Inc.), Rubber Chemicals Division, Wilmington 98, Delaware.

*U. S. PAT. NO. 2,406,722

**DU PONT RUBBER CHEMICALS**

E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Del.

DU PONT

REG. U.S. PAT. OFF.

BETTER THINGS FOR BETTER LIVING...THROUGH CHEMISTRY

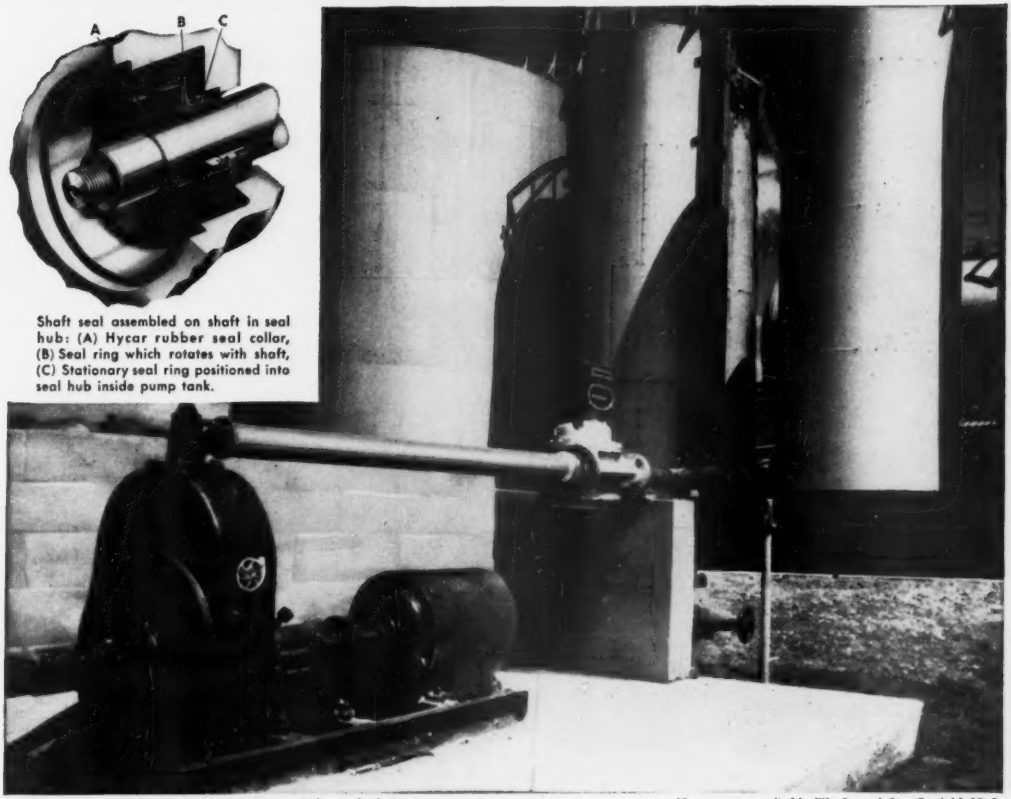
THE RUBBER AGE, published monthly by The Palmerton Publishing Co., Inc., Printing Office, East Stroudsburg, Pa. Editorial and Advertising Offices at 250 West 57th Street, New York 19, N. Y. Entered as second class matter October 20, 1933, at the Post Office at East Stroudsburg, Pa., under the Act of March 3, 1879. Subscription in United States, $3.00 a year; Canada, $3.50; Foreign, $4.00. July, 1950, Vol. 67, No. 4.

***Another development using***

**B. F. Goodrich Chemical Company** ***raw materials***




Shaft seal assembled on shaft in seal hub: (A) Hycar rubber seal collar, (B) Seal ring which rotates with shaft, (C) Stationary seal ring positioned into seal hub inside pump tank.



*Self-priming centrifugal pump by Marlow Pumps, Ridgewood, N. J.* *Hycar parts supplied by The Laurel Co., Garfield, N. J.*

# HYCAR helps put shaft leaks out of business . . . quick!

PREVENTING shaft leaks is done better than ever with a new mechanical shaft seal pictured here. And Hycar rubber helps turn the trick!

The pump shown above, equipped with the new shaft seal, is used at an oil company bulk plant. Leakage of liquid or entrance of air where the rotating pump shaft enters the stationary pump housing must be prevented —to maintain speedy, efficient operation. Leaks never get started, with this Hycar-protected shaft seal on the job!

The cutaway view shows the seal components. Two perfectly flat seal surfaces are run together and held in sealing contact by the Hycar rubber seal collar. The collar drives the rotating seal ring, keeps it in contact with the stationary seal ring. At the same time, it seals the rotating ring to the pump shaft.

Naturally, the rubber seal collar has to have exceptional qualities. That's why Hycar was selected. For to seal effectively, the collar had to slip on the pump shaft yet not "freeze" to it. It must possess resilience, good abrasion-resistance, oil-and-heat-resistance. And high tensile strength, plus low compression set at high temperature are also necessary.

On all counts, Hycar fills the bill perfectly. For Hycar resists oil, gas, heat, weather and wear—has many more advantages. Hycar may be just what you need to develop or improve a product—start more profits coming your way. For technical bulletins, please write Department HA-4, B. F. Goodrich Chemical Company, Rose Building, Cleveland 15, Ohio.

**B. F. Goodrich Chemical Company**
**A Division of The B. F. Goodrich Company**

**Need abrasion resistance? Hycar has it—plus high tensile strength and more advantages.**

**Hycar**
Reg. U.S. Pat. Off.
*American Rubber*

**GEON polyvinyl materials • HYCAR American Rubber • GOOD-RITE chemicals and plasticizers**

## *For high hot tensile, experts say—*
## *Make rubber stocks with* **Philblack* A!**

Hang it all, what can you tell by a picture? We wish you could really see this marvelous performer in action! High hot tensile! Exceptionally good stress-strain properties even at elevated temperatures. And Philblack A scores over channel black again and again for longer flex life . . . lower heat buildup . . . better compression set . . . and higher resilience!

To decrease costs and, at the same time, improve processing characteristics . . . use Philblack A. Use it in both natural and synthetic stocks.

**PHILLIPS CHEMICAL COMPANY**

*PHILBLACK SALES DIVISION*

EVANS BUILDING · AKRON 8, OHIO

Warehouses in Akron, Boston, Chicago and Trenton. West Coast agent: Harwick Standard Chemical Company, Los Angeles. Canadian agent: H. L. Blachford, Ltd., Montreal and Toronto.

*A Trademark

## Shoe sole makers:

# Let's talk "processability"

### in reinforcing resins

PLIOLITE S-6B

USE PROVED Products

RECENTLY, you've probably heard a lot of claims about "easy processing" in reinforcing resins. We have, too; and now, after an extensive study, we can give you our answer. The accompanying chart gives an excellent summary of our results which add up to the fact that **Pliolite S-6B** is the easy processing resin to end all claims for this property.

Please remember we're not making idle conversation or postulating unproved theories. Our statement is based on cold, hard facts—backed up by actual laboratory results. We did not make a superficial examination; but, rather, delved into every aspect of processability as thoroughly as possible.

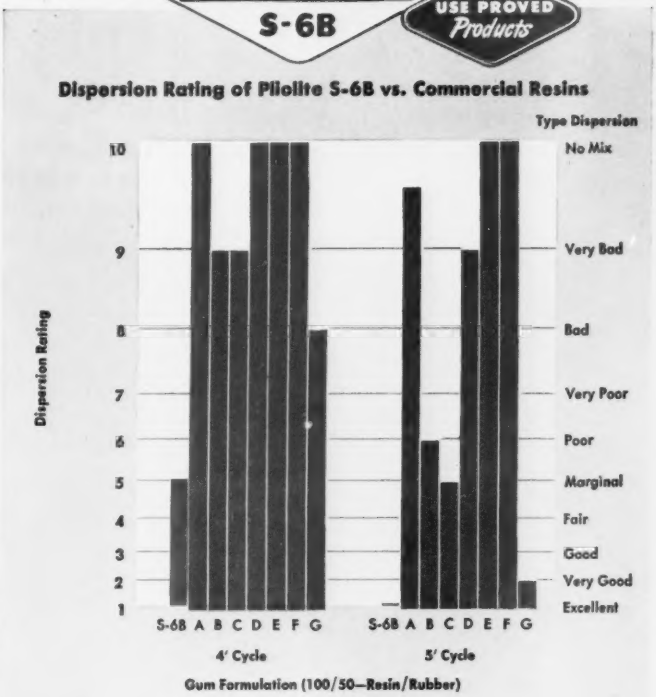
Among the studies we conducted were the following:

1. Effect of Resin Particle Size
2. Effect of Type of Resin Particle
3. Effect of Resin Flow Characteristics
4. Effect of Resin Softening Point
5. Effect of Banbury Temperatures
6. Effect of Banbury Cycle

In addition to these studies, full physical evaluations in typical sole stocks were conducted on all the resins investigated to make certain that easy processing was not obtained through a sacrifice of reinforcing properties.

As a result of our work, we came to the definite conclusion that the resin which we now market as **Pliolite S-6B** is the best easy processing and reinforcing resin on the market. Once you've tried this new resin, we think you'll agree with our findings. So, why not write today for full details and samples of **Pliolite S-6B**, the truly easy processing resin that will give you better shoe soles? Write to:

**Goodyear, Chemical Division**
**Akron 16, Ohio**



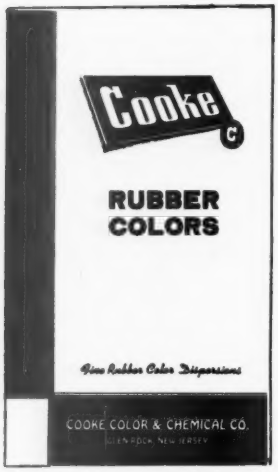

**Proof of processability** that's outstanding. Dispersion ratings were made after visual examination of mill tailings sheeted out to 0.10". Masterbatching was accomplished in laboratory Banbury at 30 r.p.m. with 100°F water on shell and rotor. Batch discharge temperatures for both 4' and 5' cycles ranged from 200°F-218°F. Note that the superior processability of **Pliolite S-6B** is clearly defined.

Pliolite—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

GOODYEAR

*think of* **COOKE'S**

*when you think of* **RUBBER** **COLORS**




Above is shown the cover of our new Color Chart. If you have not received a copy, send for it today. It gives you actual colored rubber samples in more than 20 basic shades which can be blended to get the exact tone you require.

**Yes, COOKE'S–the line of *Proved* Rubber Colors which has gained such general recognition in the rubber industry for depth of tone, high stability, permanency, and ease of handling.**

**COOKE'S Colors are quality colors for use in Natural or Synthetic Rubber and in Vinyl Plastics. They will stand all cures, are non-bleeding and non-migrating, and assure an exact color control of your products.**

**These colors are furnished as soft dispersions (50% each of organic toner and neutral polymer). They are unsurpassed for ageing properties and will stand long storage and temperature changes. They have high tinctorial value and give a clean, bright tone to the finished product. In short, they are the industry's highest quality rubber colors!**

Cooke

**COOKE COLOR & CHEMICAL CO.**
**GLEN ROCK, NEW JERSEY**
**Plant and Laboratory: Hackettstown, N. J.**

**WE COVER THE WATERFRONT**

**LOTOL***
Compounded latices—ready to use

**KRALAC***
Plastic latices

**NITREX**
Butadiene acrylonitrile copolymer latex

**SHRINK-MASTER**
Process for rendering woolens shrink resistant and long wearing

**LATEX**
Natural and synthetic

**KANDAR***
Permanent finish for textiles

**KOLOC***
Cationic resin compositions for cotton, rayon, and wool

**NAUGATEX***
Dispersed chemical compounding ingredients for all latices

**KRALASTIC**
Flexible plastic latices

**DISPERSITE***
Aqueous dispersion of rubber, reclaimed rubber, or resins

●

**A COMPLETE LINE OF WATER-BASED LATEX MATERIALS**

*Reg. U. S. Pat. Off.

ANOTHER NAUGATUCK COLLOID

# BUTYL LATEX

## Butyl Rubber in Latex Form

Butyl rubber has made a place for itself because of good aging characteristics, freedom from light discoloration, low moisture-vapor transfer and other outstanding properties. It is made at extremely low temperatures following mass polymerization techniques rather than by emulsion polymerization as with many other synthetic materials.

In order to make the outstanding characteristics of butyl available in latex form, Naugatuck Chemical has developed a whole new series of water-based dispersions based on butyl rubber suitable for coating, saturating, and adhesive applications.

For further information, write or call your nearest Naugatuck technical representative.

**NAUGATUCK CHEMICAL**

*Division of United States Rubber Company*

"Headquarters for Latex, Lotols and Dispersites"

NAUGATUCK, CONNECTICUT

BRANCHES:
Akron Chicago
Boston New York
Los Angeles Philadelphia
Charlotte, N. C.

Other Products of Naugatuck Chemical are:
PLASTICS • RUBBER CHEMICALS
AGRICULTURAL CHEMICALS • SYNTHETIC RUBBER

# Carlisle ups tube output with Taylor Control

THE Carlisle Tire and Rubber Company of Carlisle, Pa., makes high quality tubes for automobile, truck and airplane tires. By using Taylor automatic temperature control on existing equipment, *they've sharply increased tube production with fewer rejects.*

Those presses (below) were made for Carlisle by the McNeil Machine and Engineering Company. Molding temperature in each press is controlled by a Taylor FULSCOPE* Temperature Controller (not shown) with its bulb in the condensate discharge, using Taylor's System of Induced Steam Circulation. This is one of hundreds of such systems now operating successfully on unit vulcanizers and platen presses. A FLEX-O-TIMER* Time Cycle Controller (shown) above each press actuates a Diaphragm Valve and automatically controls the entire molding cycle, from the closing of the press to the end of the cure, including the opening of the press.

Carlisle bought their first Taylor instruments 24 years ago. They're still using some of those original instruments and report—"Running perfectly!" When modernizing present, or ordering new equipment, specify "Taylor-equipped, as usual!" Or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada. *Instruments for indicating, recording and controlling temperature, pressure, humidity, flow and liquid level.*

*Reg. Trade-Mark

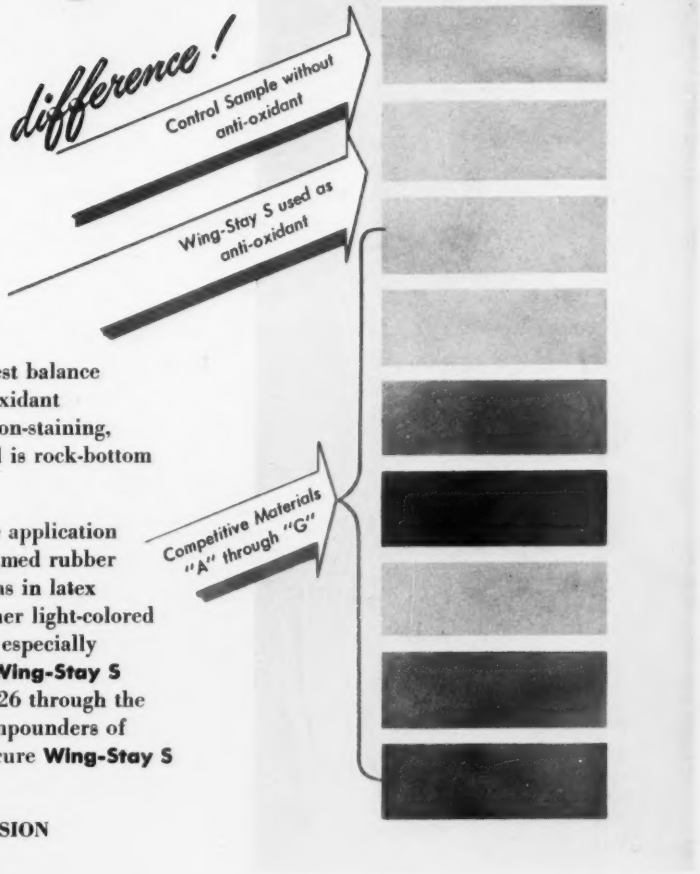
Taylor FLEX-O-TIMER Time Cycle Controllers on a line of McNeil tube molding presses at Carlisle Tire and Rubber Company, Carlisle, Pa. Once the operator pushes a start button, Timer automatically controls whole operation, relieving him for other duties.

*Taylor Instruments*
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY

# For a superior non-staining anti-oxidant—

## insist on *Wing-Stay S*

*Look at the difference!*




*Wing-Stay S* offers the best balance of characteristics of any anti-oxidant available today. It is tops in non-staining, non-discoloring properties and is rock-bottom in price as well.

Present uses include extensive application in white sidewall tires and foamed rubber products of all kinds, as well as in latex coatings, dipped goods and other light-colored items where its properties are especially welcome. GR-S users can get **Wing-Stay S** already incorporated in GR-S 26 through the Office of Rubber Reserve. Compounders of natural rubber or latex can secure **Wing-Stay S** in any quantity by writing:

GOODYEAR, CHEMICAL DIVISION
AKRON 16, OHIO

*In an enamel staining test conducted at 158° F for 7 days, Wing-Stay S showed non-staining characteristics comparable with any available anti-oxidant and at much lower cost.*

USE PROVED *Products*

GOODYEAR

Wing-Stay—T.M. The Goodyear Tire & Rubber Company, Akron, Ohio

# RECIPE

from the Barrett Rubber Research Laboratory
FOR

# CUMAR*

## RESIN, LIGHT EX GRADE,

in Natural Rubber

**RECIPE**

| | |
|---|---|
| Smoked Sheets | 100.00 |
| "CUMAR" Resin, Light EX Grade | 10.00 |
| "Philblack" A | 62.50 |
| Calcium Carbonate (Precipitated) | 50.00 |
| "Silene" EF | 25.00 |
| Zinc Oxide | 5.00 |
| Stearic Acid | 2.00 |
| "Agerite" Alba | 1.00 |
| "Sunproof" | 1.00 |
| Sulfur | 2.50 |
| Benzothiazyl Disulfide | 1.00 |
| DOTG | 0.25 |
| **Total** | **260.25** |

| | |
|---|---|
| Specific Gravity | 1.37 |
| Rubber Hydrocarbon, % by Weight | 38.5 |
| Rubber Hydrocarbon, % by Volume | 57.0 |
| Mooney Viscosity, ML, 4 min. @ 212 F. | 57.0 |

Scorch Test: Press Cures @ 250 F.

| Minutes | Cure |
|---|---|
| 5 | None |
| 10 | Slight |
| 15 | Fair |

**Press Cure at 316 F. (70 lb.)—10 Minutes:**

| Tension and Hardness Data | Unaged | Aged 24 Hrs. @ 100 C. |
|---|---|---|
| Stress, 300%, psi. | 1500 | 1600 |
| Tensile, psi. | 1900 | 1700 |
| Elongation, % | 400 | 310 |
| Hardness, Shore A | 79 | 82 |
| Tear-Resistance, Angle, lb./1-in. thickness | 185 | 145 |

**Press Cure at 316 F. (70 lb.)—15 Minutes:**

| | | |
|---|---|---|
| Abrasion Resistance, du Pont cc. loss/ hp-hr. | 275 | 300 |
| Compression Set, 25% Constant Deflection, % | 43 | — |
| Resilience, Yerzley, 20% Deformation, % | 44 | 33 |
| Rebound, Goodyear-Healey, % | 53.0 | 47.8 |
| Contact Stain (24 hrs. @ 175±2 F.) | Slight | — |
| Migration Stain (24 hrs. @ 125±2 F.) | Slight | |

To confer efficient and safe processibility, and to impart smooth and rapid calendering and extruding properties, "CUMAR" resin, light EX grade, is an exceptionally effective processing aid. It has found wide application in the compounding of natural rubber and synthetic elastomers.

Its reinforcing feature modifies the nerve of the rubber, minimizes shrinkage, and prevents sagging and flattening in open steam and air cures. Its extending character improves physical properties, and permits higher filler loading, thereby reducing compounding costs. The light EX grade of "CUMAR" resin is also extremely valuable for improving cut-growth resistance, and hot and cold tear-resistance.

In the design of automotive and aeronautical parts, mechanical and proofed goods, flooring, matting, bumper and channel stocks, and in items which are to be used in contact with dark-colored enamels and lacquers, "CUMAR" resin, light EX grade, promotes quality along with economy.

Barrett*

*Reg. U. S. Pat. Off.

**THE BARRETT DIVISION**
**ALLIED CHEMICAL & DYE CORPORATION**
**40 Rector Street, New York 6, N. Y.**

# CARBON BLACKS

**UNITED CARBON COMPANY, INC.**

CHARLESTON 27, W. VA.

NEW YORK • AKRON • CHICAGO • BOSTON

# KOSMOS 50

Battery of furnaces for the production of carbon black.

**Kosmos 50 is a United quality black with top rating for fast extrusion and glossy smoothness. It is unsurpassed as an aid in processing.**

**Kosmos 50 is a furnace process oil-base black of the FEF (fast extruding) type. It is quick curing, strongly reinforcing, and resistant to abrasion.**

**Kosmos 50 has wide applications and compounders take to it for obvious reasons. Standardize on Kosmos 50 for improved efficiency and leadership.**

RESEARCH DIVISION

**UNITED CARBON COMPANY, INC.**

Charleston 27, West Virginia

# everybody talks QUALITY

**R-1599** **R-2199** **R-2899**

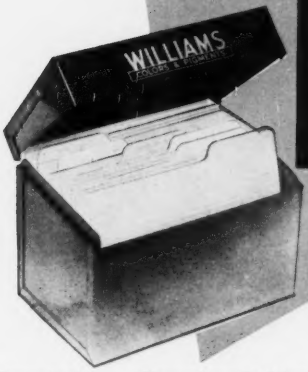
## these Pure Light Red Iron Oxides by Williams assure it!

**They represent the ultimate in red iron oxide colors for the rubber industry.**

**Williams iron oxides come to you with all the benefits of our 72 years in the pigment business . . . and as a result of our experience in producing pure red iron oxides to specifications of the leading rubber companies.**

**Each is manufactured to rigid specifications for copper and manganese content, pH value, soluble salts, fineness, color, tint and strength by controlled processes and with special equipment. The result is absolute uniformity of product.**

**If you haven't already done so, try these finest of all iron oxide colors. Your own tests will show there is no equal for Williams experience.**



**LET WILLIAMS PUT THE MICROSCOPE ON *Your* COLOR PROBLEM**

Whatever your color problem, bring it to Williams. Our 72-year experience can often save you time, money, and headaches in proper color formulation.

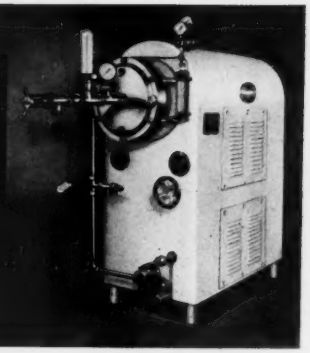
**Address Dept. 8, C. K. Williams & Co., Easton, Pa.**

# WILLIAMS
COLORS & PIGMENTS

**Iron Oxides • Chromium Oxides**
**Extender Pigments**

**C. K. WILLIAMS & CO.**
**Easton, Pa. • East St. Louis, Ill. • Emeryville, Cal.**

# OAKES
## CONTINUOUS, AUTOMATIC
# FROTHING MACHINE



**GIVES YOU IMPORTANT**

# UNIFORM CELL STRUCTURE ON LATEX WORK

200 to 2,000 pounds of liquid latex per hour.

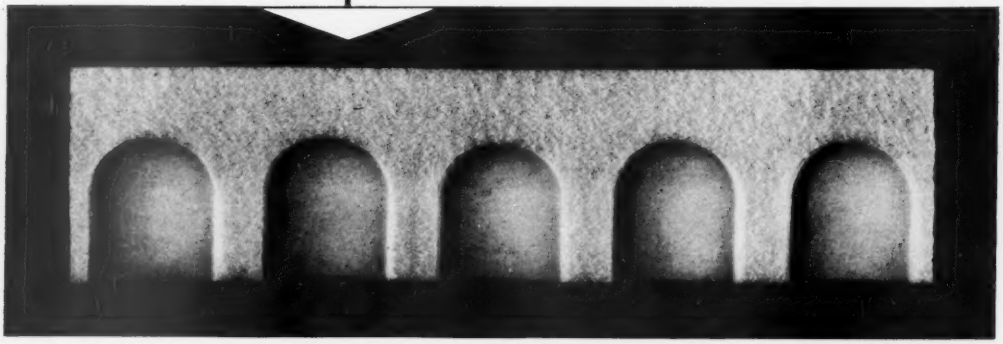
Produces latex blow-ups of 6 to 18

Ideal for slab or mold work, rug backings, pillows, mattresses, furniture and automobile upholstery.

Suitable for INJECTION MOLDING

FOR COMPLETE INFORMATION

Write to Mr. T. R. Stevens,
Continuous Mixing Division,
AMERICAN MACHINE & FOUNDRY COMPANY
485 Fifth Avenue, New York 17, N. Y.



Unretouched photograph of foam rubber frothed on the AMF-OAKES Continuous, Automatic Frothing Machine. (Latex blow-up of 14)

# RETARDER PD
## solves scorch problems

RETARDER PD® is the proved anti-scorch agent that gives remarkable results even in hot weather.

This non-toxic, fine white powder gives good retarding or anti-scorch effects at processing temperatures, with very little or no retarding effects at curing temperatures. Practically non-discoloring, it is ideal for use in white and light-colored stocks.

RETARDER PD works well with the thiazole type of accelerators, or with combinations of the thiazole and guanidine accelerators or thiuram disulfides. It does not affect the physical properties or aging qualities of vulcanized stocks.

Send for Calco Technical Bulletin.

Calco®

AMERICAN Cyanamid COMPANY
CALCO CHEMICAL DIVISION
INTERMEDIATE & RUBBER CHEMICALS DEPARTMENT
BOUND BROOK, NEW JERSEY, U.S.A.

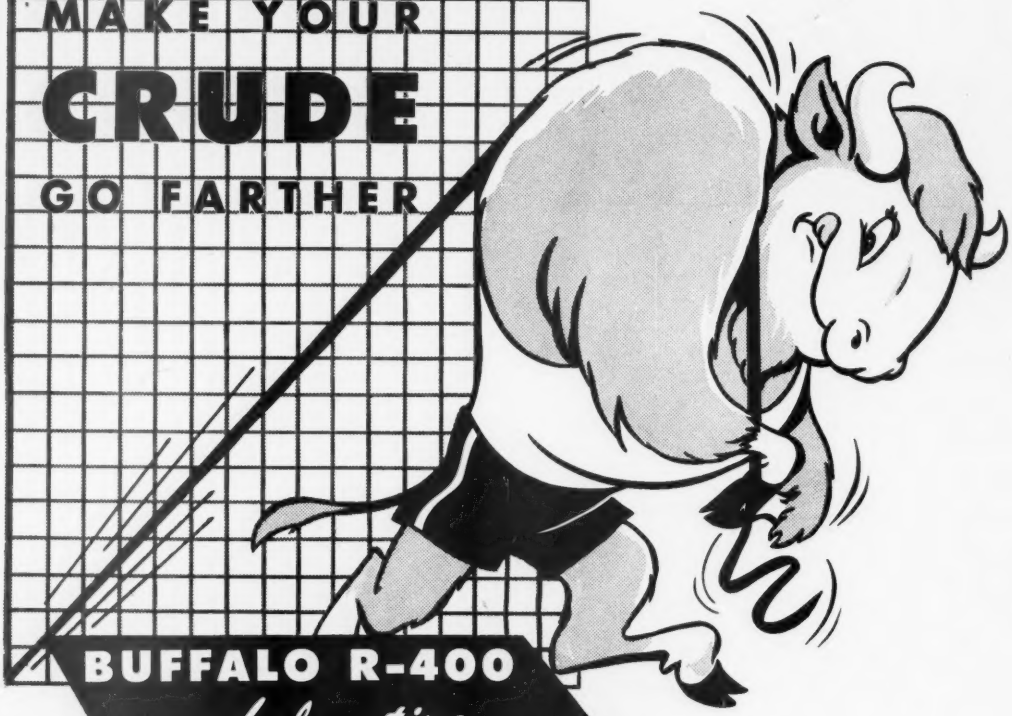
SALES REPRESENTATIVES AND WAREHOUSE STOCKS: Akron Chemical Company, Akron, Ohio • Ernest Jacoby and Company, Boston, Mass. • Herron & Meyer of Chicago, Chicago, Ill. • H. M. Royal, Inc., Los Angeles, Calif. • H. M. Royal, Inc., Trenton, N.J. • In Canada: St. Lawrence Chemical Company, Ltd., Montreal and Toronto

UP your production curve and

MAKE YOUR

# CRUDE

GO FARTHER



## BUFFALO R-400

*whole-tire*

NATURAL RUBBER RECLAIM

★ The perfect plasticizer for natural rubber.

★ Greatly reduces your mixing time.

★ Permits fuller Banbury loadings.

Yes, make your expensive and scarce crude go farther by replacing part of it with Buffalo R-400, whole-tire, natural rubber RECLAIM. It's high in natural rubber content and low in specific gravity.

In addition you'll save money on processing costs because Buffalo R-400 reclaim has good tubing and calendering qualities, requires shorter breakdown time, and permits larger Banbury loadings. Buffalo R-400 assures you of a better finished product because its natural rubber content acts as a plasticizer and then vulcanizes. When used for the carcass of tires or hose and belt frictions, R-400 reduces heat build-up. In the production of plumbing specialties and mechanicals it imparts the necessary resistance to hot tear. Excellent, also, for sponge and high-grade hard rubber products. Let us tell you more about "Making Your Crude Go Farther". Write for details and free samples.

U.S. RUBBER RECLAIMING COMPANY, INC.

P. O. BOX 365 • BUFFALO 5, N. Y.

*68 years serving the industry solely as reclaimers*

TRENTON, N. J. H. M. ROYAL, INC. 689 PENNINGTON AVE.

How NEVILLE can serve the Rubber Industry

# MECHANICAL GOODS

## "R" RESINS

Particularly suited to non-staining light-colored stocks.

Ideal for non-migrating softeners, especially in oil-resistant rubbers.

Provides improved dispersion, aging and gloss as well as improved adhesion to fabric.

## PARADENE

Low-cost darker coumarone resins yielding improved aging and pigment dispersion.

Increases flex-life, affords calendering ease and tack retention in dark stocks.

## NEVOLL

A liquid coal-tar softener in natural and synthetic rubber, producing more uniform vulcanizates and improved aging properties.

Gives high tensile strength and modulus, excellent tear and abrasion resistance and low compression set.

## X-1 RESINOUS OILS

A low-cost softener for use with Neoprene stocks.

Does not retard cure, promotes good stability in Neoprene stocks.

**Why not call on Neville's years of research and experience for help on your rubber production problems?**

SILVER ANNIVERSARY NEVILLE 1925-1950

Chemicals for the Rubber Industry

R 41

**THE NEVILLE COMPANY**

PITTSBURGH 25, PA.

## MR. CLIMCO SAYS...

# LINERETTE PAPER

## is *ideal* for separating lightweight stocks

In use for over 20 years, Linerette is a quality, specification sheet that provides a quick and easy way to separate stock without adhesion. Linerette preserves the tackiness of the stock and contains no oil or wax which might migrate.

LINERETTE is furnished in any width up to and including 54", in rolls of 9", 11½", 13", and 15" diameters; put up on 3" i. d. cores. The yield is approximately six square yards to the pound. A 9" roll contains 375 linear yards and a 15" diameter about 1150 linear yards.

*SEND FOR SAMPLES*—simply specify width desired.

**THE CLEVELAND LINER & MFG. CO.**
**5508 Maurice Avenue • Cleveland 4, Ohio, U. S. A.**
*Cable Address:* **"BLUELINER"**

**ILLUSTRATED LINER BOOKLET**

Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

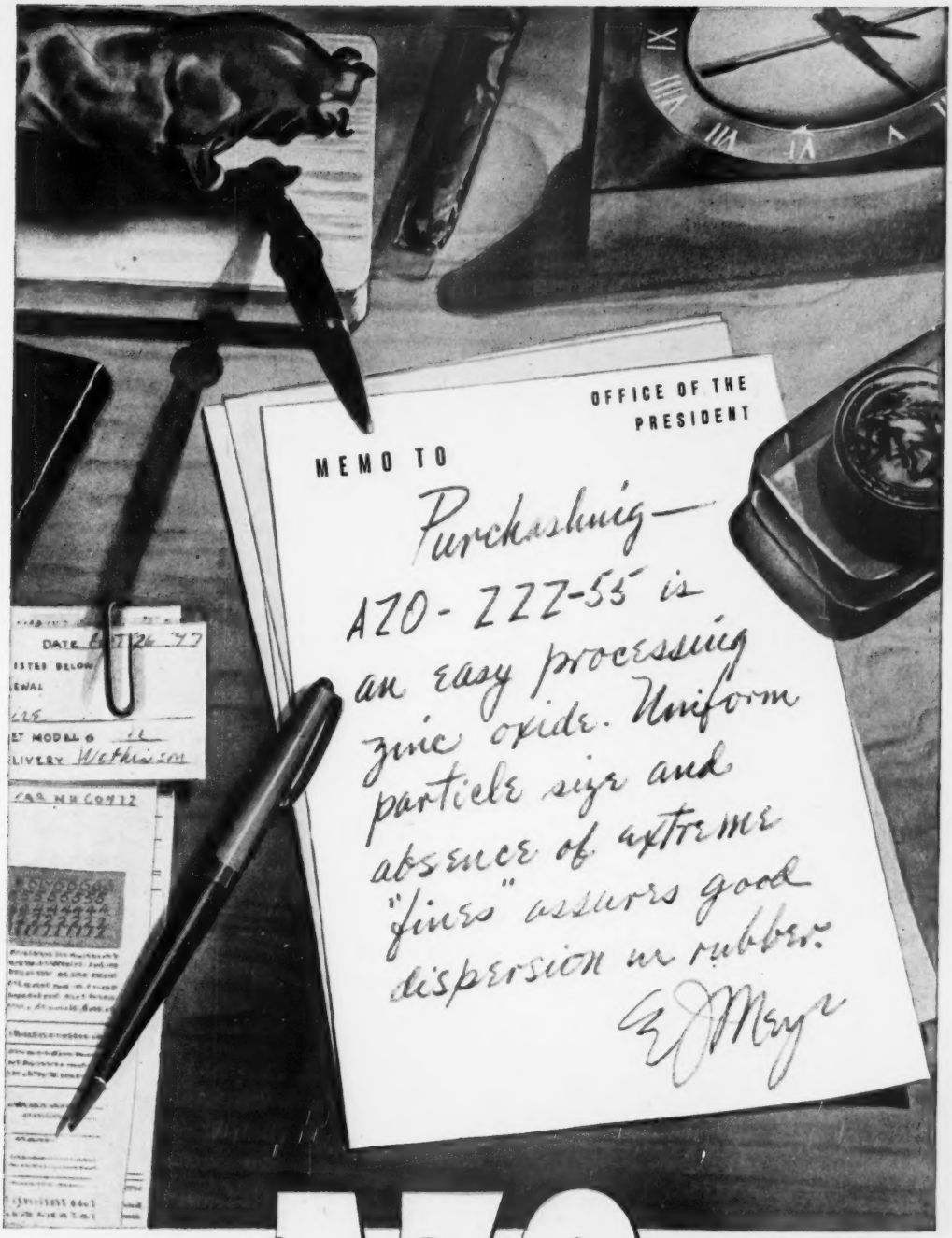
MADE BY THE MANUFACTURERS OF CLIMCO PROCESSED LINERS

# LINERETTE

## INTERLEAVING PAPER

CLIMCO

CLIMCO


OFFICE OF THE PRESIDENT
MEMO TO
Purchasing—
AZO-ZZZ-55 is an easy processing zinc oxide. Uniform particle size and absence of extreme "fines" assures good dispersion in rubber.

*Uniform-Dependable*

**AZO ZINC OXIDES**

**AMERICAN ZINC SALES CO.**

*Distributors for*

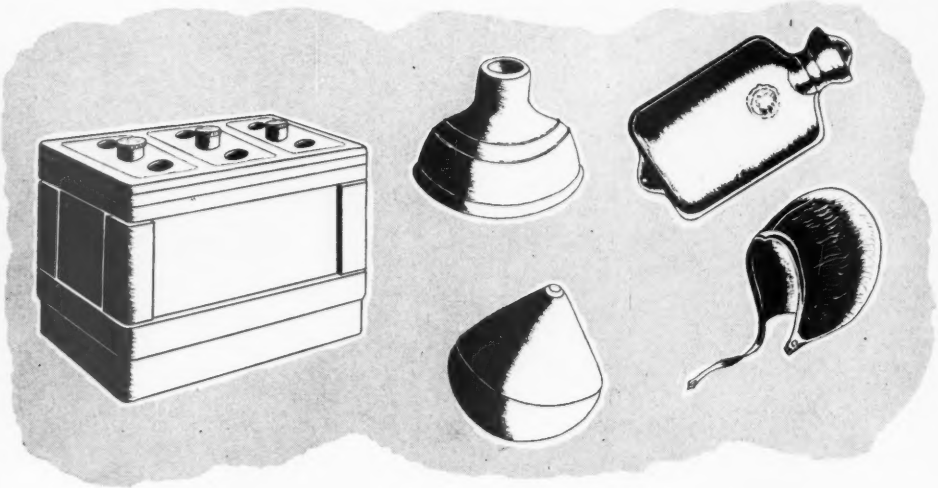
**AMERICAN ZINC, LEAD & SMELTING CO.**

COLUMBUS, OHIO · CHICAGO · ST. LOUIS · NEW YORK

*Coming Next Month...*

# The Most Modern Mechanical Mold Plant

**Will be equipped with the very latest type of machinery for manufacturing mechanical molds**



**The machinery for this new plant is being installed rapidly and will be ready to start production within a few weeks to serve the manufacturers of miscellaneous molded products.**

***WATCH THIS PAGE FOR FULL DETAILS NEXT MONTH***

# All-around Accelerator for all rubber goods...

# EL-SIXTY

Monsanto El-Sixty* delivers everything you want in accelerator performance whether your product is the most delicate of drug sundries or the most rugged of tires or industrial rubber.

**EL-SIXTY OFFERS THESE ADVANTAGES:**

- **Safe handling**
- **Versatility**
- **Good performance in white or colored stocks**
- **Ability to wade through retarding pigments**
- **Excellent in pure gum or reclaim stock**
- **Most stable accelerator in latex — causes no thickening in tanks**
- **Can be used alone or activated with Guantal,* Guanidines, Aldehydes, Thiurad,* or Thiurams**

Better give El-Sixty a trial! For information, samples and prices, mail the coupon or write: MONSANTO CHEMICAL COMPANY, Rubber Service Department, 920 Brown Street, Akron 11, Ohio.

*Reg. U. S. Pat. Off.

MONSANTO
CHEMICALS — PLASTICS

MONSANTO CHEMICAL COMPANY
Rubber Service Department
920 Brown Street, Akron 11, Ohio

Please send, without cost or obligation, technical information, prices and sample of El-Sixty.

*Name*..... *Title*.....

*Company*.....

*Street*.....

*City*..... *Zone*..... *State*.....

**SERVING INDUSTRY . . . WHICH SERVES MANKIND**

for UNDER-FOOT

or FOOT-WEAR

...TITANOX ADDS QUALITY TO RUBBER

Whether underfoot in rubber tile; in rubber footwear or in numerous other articles, TITANOX pigments bring out the appearance of quality in white and light-tinted rubber goods—add good looks that bring increased sales. Chemically inert, these titanium pigments are highly compatible with all types of rubber. Their outstanding ease of mixing speeds production, helps save on production costs.

For pure gum and lightly loaded stocks the strongest pigments TITANOX-A and TITANOX-RA assure the desired whiteness or brightness at minimum loadings thus maintaining flexibility. For heavily loaded stocks, TITANOX-RCHT (rutile-calcium pigment) is preferred for economical whiteness and brightness. Its finely divided inert pigment and extender promote normal aging and add resistance to discoloration.

Our Technical Service Department is ready at any time to be a partner in solving your rubber pigmentation problems. Write us today for further information. Titanium Pigment Corporation, 111 Broadway, New York 6, N. Y.; 104 South Michigan Avenue, Chicago 3, Ill.; 2600 South Eastern Avenue, Los Angeles 22, Calif. Branches in all other principal cities.

8059

® TITANOX

*the brightest name in pigments*

TITANIUM PIGMENT CORPORATION

*Subsidiary of* NATIONAL LEAD COMPANY

# 4 BAKER CHEMICALS
## of interest to The Rubber Industry

### MAGNESIUM OXIDE
**(Neoprene Grade)**

A very light, finely-divided powder completely uniform in bulk density, particle size, and chemical activity. Calcined in electric furnaces to insure dependable performance when it is compounded with neoprene and other synthetic rubbers.

### MAGNESIUM CARBONATE
**(Technical Light Powder)**

Particular emphasis is placed on uniformity of physical specifications, which reflect in trouble-free compounding of rubber products. Impurities such as iron and calcium are extremely low due to exacting chemical control.

### CALCIUM NITRATE
**(Technical Crystal)**

A high purity chemical especially manufactured to meet the requirements of compounders of latex products. It is produced as creamy-white crystals 1½" and smaller in diameter, containing 3 molecules of water of crystallization.

### CARBON DISULFIDE
**(Carbon Bisulfide)**

Freedom from other sulfides (Assay of 99.99%) makes Baker's carbon Disulfide a preferred solvent in the rubber industry. Manufacture by a unique electro-thermic method, with continuous rather than batch distillations, insures uniformity.

J. T. BAKER CHEMICAL CO.
Executive Offices: Phillipsburg, N. J.

Baker's Chemicals

C. P. ANALYZED • FINE • INDUSTRIAL

*for*

**COLORED**
BUTYL INNER TUBES
MECHANICAL GOODS
DRUG SUNDRIES

*use—*

# WHITETEX

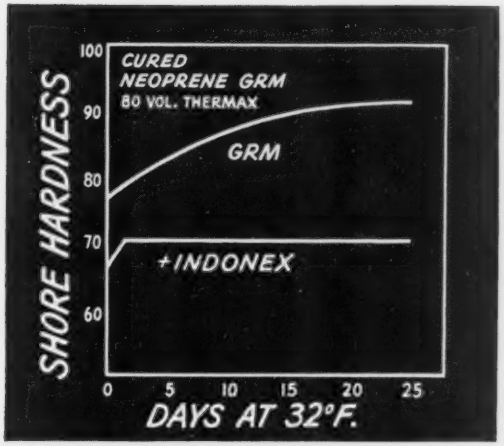
● **FINE particle size white pigment. Brightness 90-92. GOOD reinforcing. Excellent *processing*.**

» » **SAMPLES SENT PROMPTLY ON REQUEST.** « «

## SOUTHERN CLAYS, Inc.

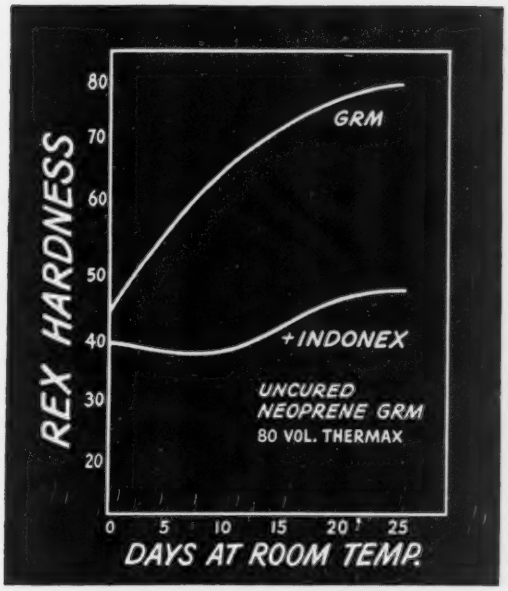
33 RECTOR STREET
NEW YORK 6, N. Y.

# Indonex Plasticizers




are outstanding as . . .

## Crystallization Retarders




in cured and uncured

## Neoprene Stocks

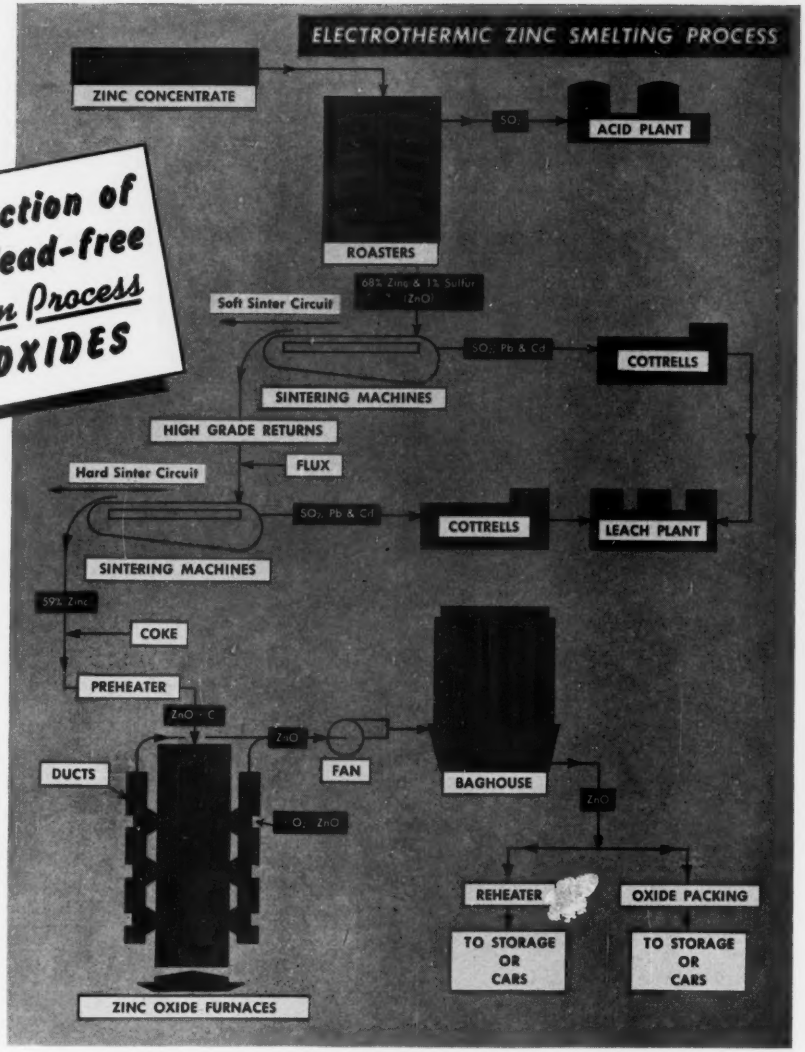
Send for Circular 13-38

INDOIL®
CHEMICAL PRODUCTS

## INDOIL CHEMICAL COMPANY

910 South Michigan Avenue • Chicago 80, Illinois

# The Production of ST. JOE lead-free *American Process* ZINC OXIDES



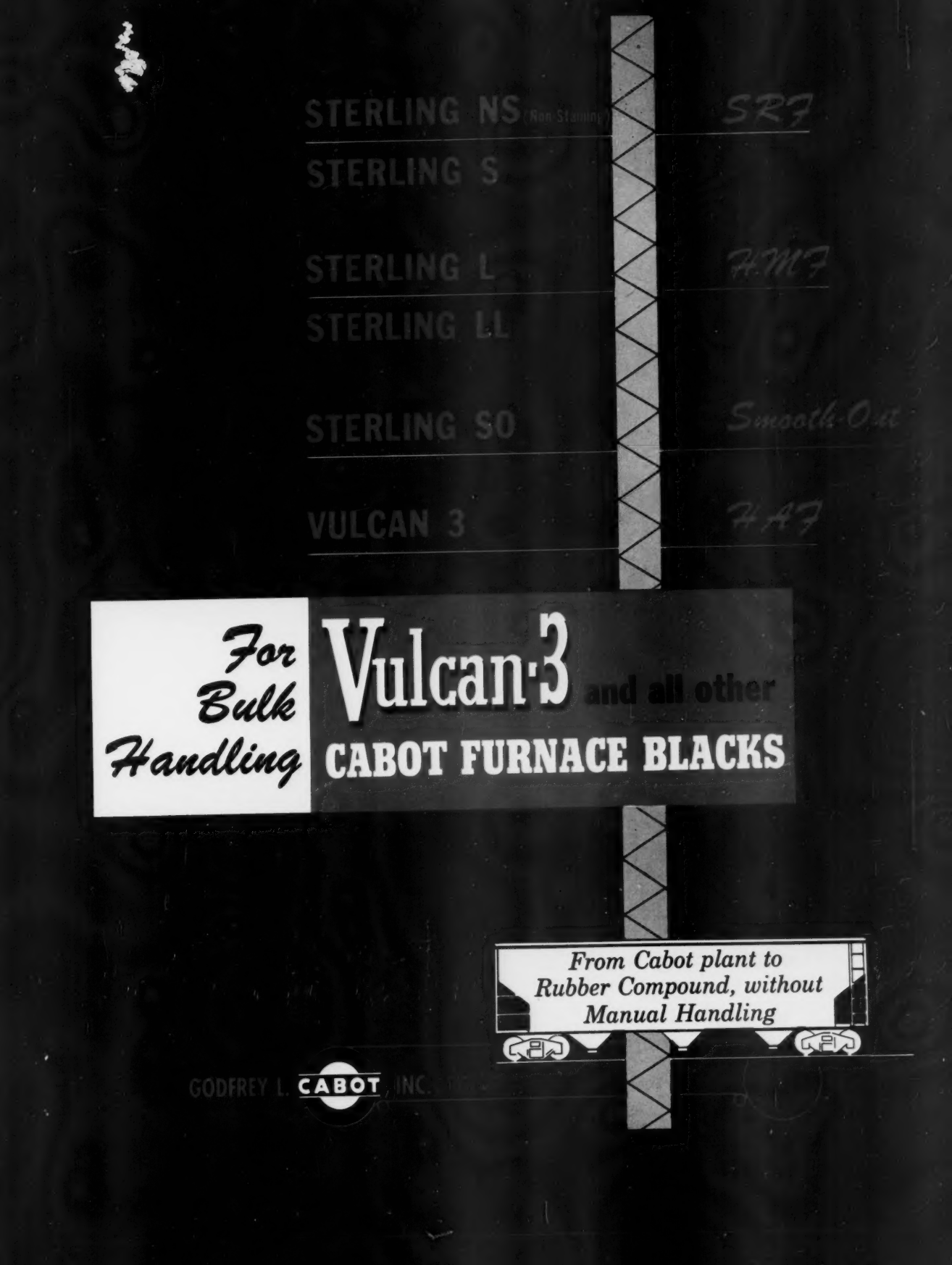

A schematic diagram of the St. Joe electrothermic process for the manufacture of lead-free zinc oxides.

The direct-from-ore, or American Process, is more economical than the two-step, or French Process. By the latter, metallic zinc is produced first and, by a second step, is converted into zinc oxide. The American Process, in addition to being less expensive, also produces types of zinc oxides that impart superior properties to many products in which they are used. The electrothermic method, a modification of the American Process, is unique in that zinc oxides produced by this method combine most of the desirable properties of conventional American and French Process types. The same ores, equipment and procedure, used in the smelter for the production of high-grade zinc metal of 99.98% purity and commanding a premium market price, also are used in the production of the St. Joe electrothermic grades of zinc oxide. This accounts for the pigments' exceptional high quality and for the preference accorded them by many of the country's leading consumers.

**250 PARK AVENUE • NEW YORK 17 • ELdorado 5-3200**

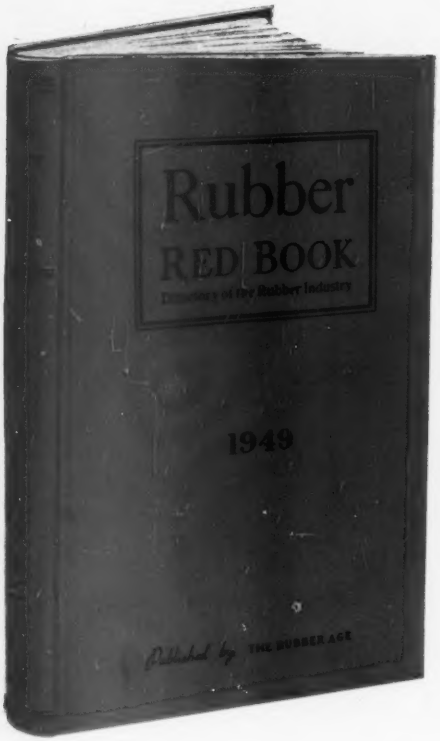
**ST. JOSEPH LEAD COMPANY**

**Plant & Laboratory, Monaca, (Josephtown), Pennsylvania**


STERLING NS (Non Staining)
SRF
STERLING S
STERLING L
HMF
STERLING LL
STERLING SO
Smooth-Out
VULCAN 3
HAF
For Bulk Handling
Vulcan-3 and all other
CABOT FURNACE BLACKS
From Cabot plant to Rubber Compound, without Manual Handling
GODFREY L. CABOT, INC.

# RUBBER RED BOOK

## —1949 Edition




**The 1949 edition of the RUBBER RED BOOK, the *Directory of the Rubber Industry*, is a volume of 928 pages — the largest issue ever published.**

This increase is reflected in almost every section of the book, particularly in the number of rubber manufacturers, with a corresponding increase of names in the "Who's Who" Section to over 9500 listings. A new section on "Educational Courses in Rubber Chemistry and Technology" has also been added.

The book is divided into three main sections:

I. RUBBER MANUFACTURERS — with personnel, products made, and a geographical breakdown of rubber plants;

II. SUPPLIERS — with complete product classifications of Machinery, Chemicals, Fabrics, Rubber (Natural, Synthetic, Reclaimed, Scrap), Latex, and other materials—with full names and addresses;

III. WHO'S WHO — a section of over 9500 names of leading people in the rubber industry, with company connections and addresses.

In addition, other sections cover Brand Names (Chemicals, Synthetic Rubber, Reclaimed Rubber); Consulting Technologists; Sales Agents and Branch Offices of Suppliers; Educational Courses In Rubber Chemistry and Technology; Technical Journals; Trade and Technical Organizations.

The RUBBER RED BOOK has become *the most indispensable and widely used book in the rubber industry* and is invaluable as a source of up-to-date information for rubber manufacturers, suppliers and all others interested in the rubber manufacturing field.

**1949 Edition** **Seventh Issue**

**928 Pages** **Cloth Bound**

**PRICE: $5.00 postpaid**

**Order Your Copy Today!**

# RUBBER AGE

## 250 West 57th St., New York 19, N. Y.

# UNIFORMITY

## *Makes the Big Difference*

## In INDUSTRIAL Fabrics

MT. VERNON — FABRICS

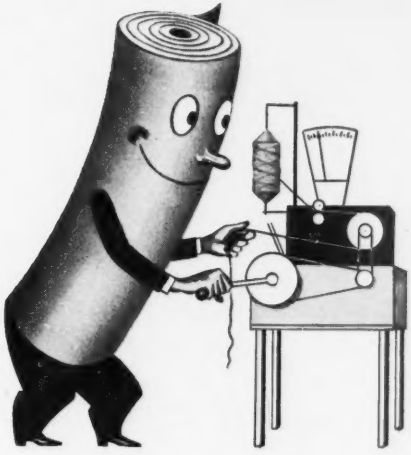
*Give You*

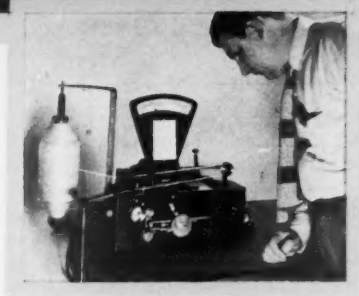
**Greater Fabric Uniformity**

The greater uniformity of Mt. Vernon fabrics means *consistent* quality in your finished products — smoother, more efficient fabrication.

**AT YOUR SERVICE**

Mt. Vernon-Woodberry's staff of textile engineers is available on request to help you with your problems in development or application of industrial fabrics.





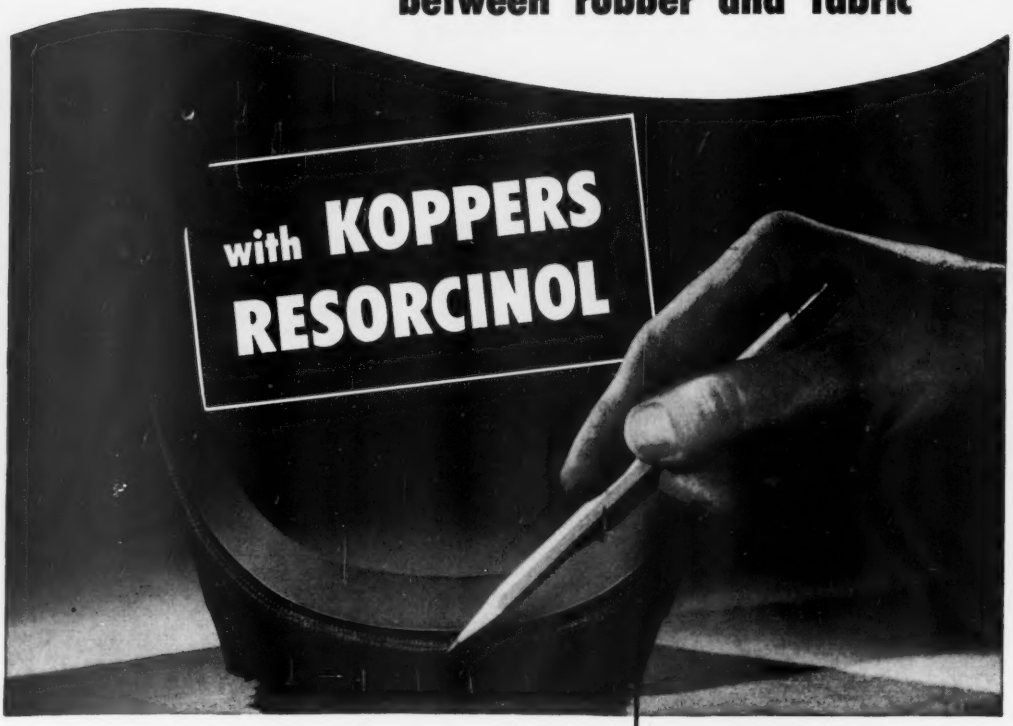
**CHECKING COEFFICIENT OF VARIATION** And Average Factor Of Quality On Evenness In Card Sliver With Belger Tester. One of a series of comprehensive laboratory controls throughout production to assure uniformity in all Mt. Vernon-Woodberry products.

TURNER HALSEY COMPANY
Selling Agents
40 WORTH ST NEW YORK

*Mt. Vernon-Woodberry Mills*

Branch Offices: Chicago • Atlanta • Baltimore • Boston • Los Angeles • Akron

# How to make a *stronger bond* between rubber and fabric




**MORE STRENGTH HERE.** Pre-treatment of the tire fabric with Resorcinol Adhesives in the latex mixture assures a stronger bond between the fabric and the tread.

TIRES, belting and other products which include laminations of rubber and fabric or cords are serviceable only as long as the parts hold together. To obtain best adhesion of rubber to fabric or cords, it is common practice to pre-treat the fabric in a mixture of rubber latex and some adhesive material. For this purpose adhesives prepared with Koppers Resorcinol are proving highly successful.

Recent tests have shown that Koppers Resorcinol Adhesives used in the pre-dip treatment produce a much stronger bond than casein. This is true with cotton, rayon and nylon fabrics but the most marked improvement is shown on the rayon and nylon.

You can prove this for yourself in your own laboratories. Write for a sample of Koppers Resorcinol and a copy of our Technical Bulletin.

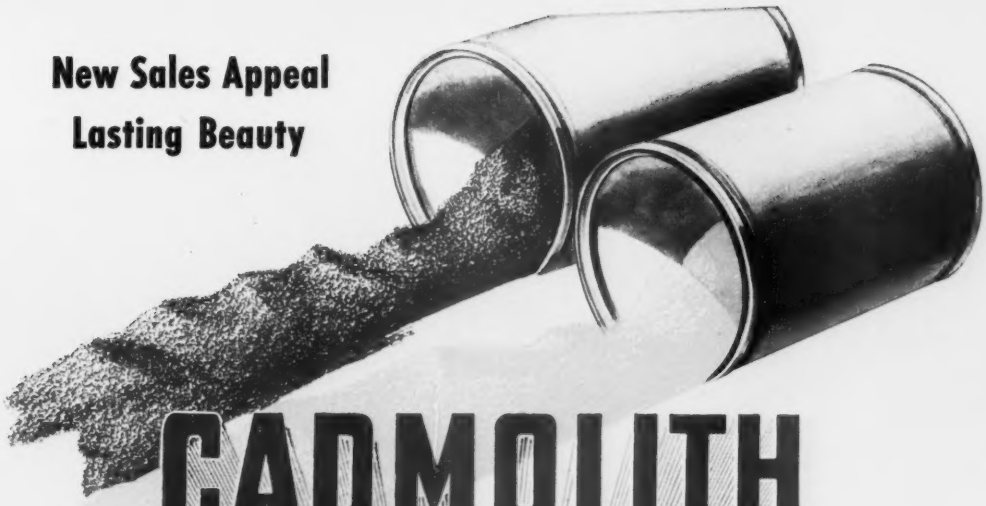
KOPPERS

**KOPPERS COMPANY, INC.**

*Chemical Division*

**Pittsburgh 19, Pa.**

**New Sales Appeal**
**Lasting Beauty**



# CADMOLITH COLORS

- Insoluble in all vehicles
- Bright clear colors
- Non-fading to light
- Non-settling
- Non-bleeding

- Soft and easy to grind
- Alkali resistant
- Acid resistant
- Heat resistant
- Opaque

## Reds and Yellows

With a combination of advantages found in no other red or yellow pigments—the direct result of Glidden leadership in research—Glidden Cadmolith* Colors are now adding new sales appeal and lasting beauty to an amazing variety of products. All shades available for prompt shipment.

*Trade Mark Registered

QUALITY Glidden PRODUCTS

*Send for Folder* giving complete details, with color chips. Write The Chemical & Pigment Company, division of The Glidden Company, Union Commerce Building, Cleveland 14, Ohio.

**THE CHEMICAL & PIGMENT COMPANY**
*Division of*
**THE GLIDDEN COMPANY**
Baltimore, Md. • Collinsville, Ill. • Oakland, California

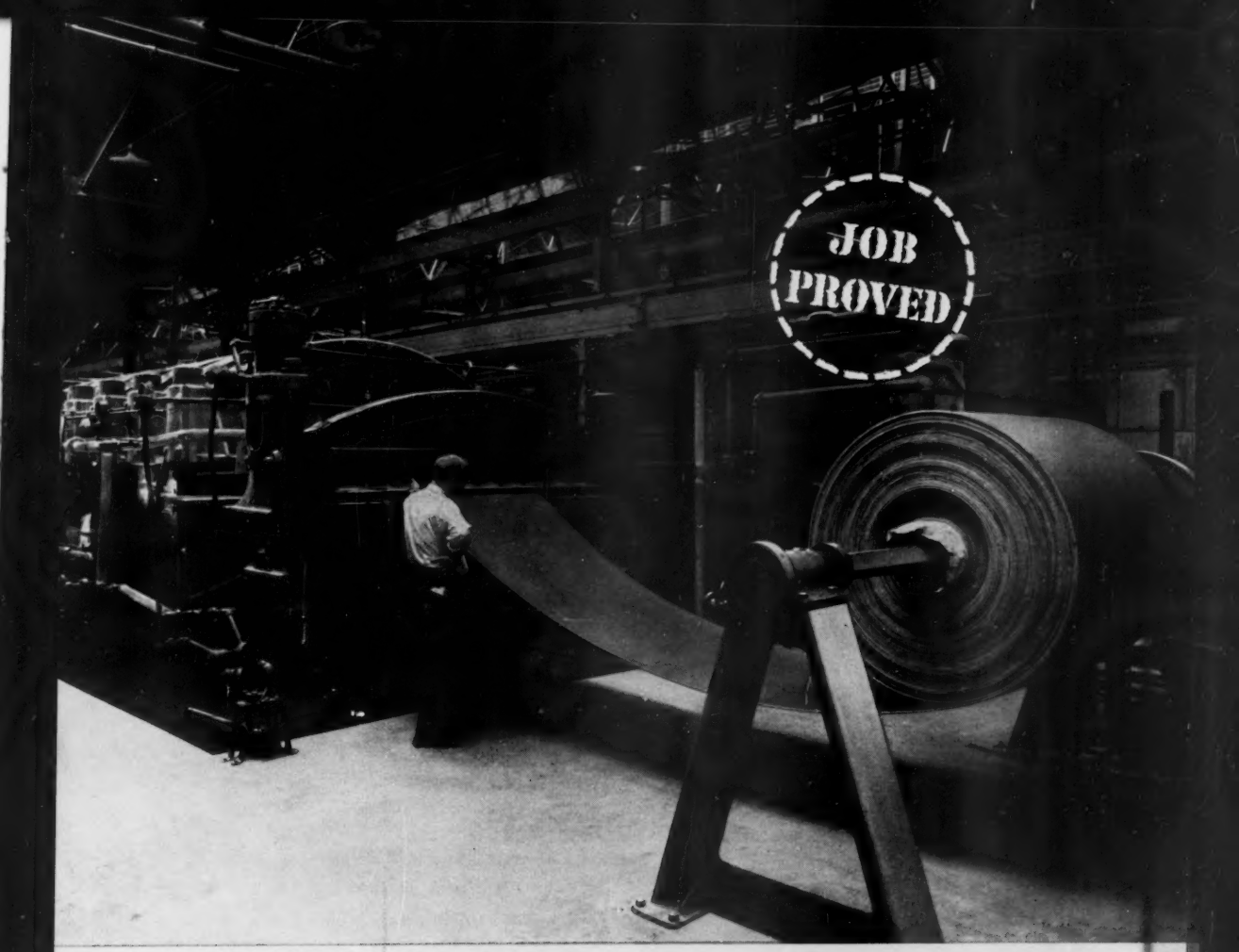
**SUNOLITH*** Lithopone
**ASTROLITH*** Lithopone
**ZOPAQUE*** Titanium Dioxide
**CADMOLITH*** Cadmium Red and Yellow Lithopone

Yes, you will profit, as have many others, if you write to EEMCO for their proposition on Rubber and Plastics Processing Machinery. Engineered right, built right and of best obtainable materials you are assured of longer life and better production when you select EEMCO. If your present or future needs include any of the machines listed below, write EEMCO for a quotation. You will like their attractive prices and quicker deliveries. Standard and custom made, of course.

MILLS
PRESSES
REFINERS
CRACKERS
LABORATORY MILLS
LABORATORY PRESSES

EEMCO ERIE ENGINE & MFG. CO.
ERIE, PENNA

RUBBER AND PLASTIC
MACHINERY DIVISION




# SAVES $6,000 A YEAR IN PROCESSING

**2 Sun Rubber-Processing Aids Improve Product Quality, Cut Inventory Costs by Replacing 5 Competitive Aids**

A manufacturer of transmission belting and conveyor belts, although turning out high quality material, was not satisfied. He was determined to produce products that were still better, if a way could be found. One possibility lay in increasing resistance to fatigue caused by the millions of rotations of the belts around pulleys.

After discussing the problem with a Sun Engineer, he decided to try Circosol-2XH for his natural rubber and GR-S stocks, and Circo Light Rubber-Processing Aid for neoprene and other synthetics. These gave just the results wanted. In fact, they proved to be so good and so versatile that the five competitive products previously used have been eliminated.

Now, with only two processing aids to buy, the company orders in tankcar lots. Savings are estimated at $6,000 a year.

Sun Rubber-Processing Aids speed up milling and calendering; minimize bleeding and migrating; reduce flex-cracking, heat build-up and hardening. In some cases they even increase the resilience of the finished vulcanizate. These "Job Proved" aids are refined for maximum compatibility with the type of rubber used—natural, synthetic, or reclaim. To learn how Sun Rubber-Processing Aids may help you, call the nearest Sun office. The services of a Sun Engineer are available without obligation.

**SUN OIL COMPANY** · *Philadelphia 3, Pa.*
*In Canada:* Sun Oil Company, Ltd.
Toronto and Montreal

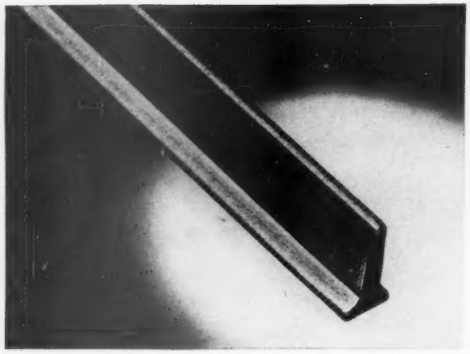
**SUN PETROLEUM PRODUCTS**
**"JOB PROVED" IN EVERY INDUSTRY**

SUNOCO

# points of interest

## ABOUT "COLD RUBBER" AND CONTINEX SRF

- Smooth tubing shown in the illustration can be achieved more economically with no sacrifice in processing safety and speed.
- Approximately 35% higher loadings of Continex SRF, formerly impossible with smooth-out HMF.
- Continex SRF in "Cold Rubber" enables the production of smooth tubing-channel compounds having minimum radial swell heretofore impossible with GR-S.
- Satisfactory compounds similar to the illustration can be produced containing from 0 to 50 parts reclaim per 100 parts "Cold Rubber."
- A non-staining Continex SRF can be supplied for specialty items where staining is objectionable.



**Samples of Continex SRF and Continex SRF-NS (Non-staining), as well as formulations, will be supplied on request.**

**Also, for more complete information, write for Technical Service Report CB-3 "Smooth Tubing *Cold Rubber* Channel Compounds."**

Continex SRF *can also be used in* natural *rubber smooth tubing-channel compounds with up to 35% higher loadings than are possible with a smooth-out type HMF black. Technical Service Report CB-2 gives details. Write for your copy* today!

**WITCO CHEMICAL COMPANY**

**CONTINENTAL CARBON COMPANY**

**295 Madison Avenue, New York 17, N. Y.**

BOSTON • CHICAGO • DETROIT • CLEVELAND • LOS ANGELES • SAN FRANCISCO • AKRON • AMARILLO • LONDON AND MANCHESTER, ENGLAND

You can formulate FASTER... BETTER with

# HORSE HEAD® ZINC OXIDES

## FORMULATE FASTER!

...Because the Horse Head line comprises the most complete family of Zinc Oxides for rubber:

1. It is the only line having such a wide range of particle sizes, surface conditions and chemical compositions.
2. Its *conventional* types cover the range of American and French Process oxides.
3. Its *exclusive* types include the well-known Kadox and Protox brands.

That means you need not waste time adapting a single Zinc Oxide to each specific compound. Instead, just choose from the Horse Head line the Zinc Oxides that best meet your needs.

## FORMULATE BETTER!

...Because you need to compromise less when you choose from the wide variety of Horse Head Zinc Oxides.

...Because the Horse Head brands can improve the properties of your compounds.

Year after year, for nearly a century, more rubber manufacturers have used more tons of Horse Head Zinc Oxides than of any other brands.

HORSE HEAD PRODUCTS

**THE NEW JERSEY ZINC COMPANY**

*Founded 1848*

**160 Front Street, New York 7, N. Y.**

Important Announcement To

# ALL EASTERN RUBBER MANUFACTURERS

## NEW C. P. HALL PLANT

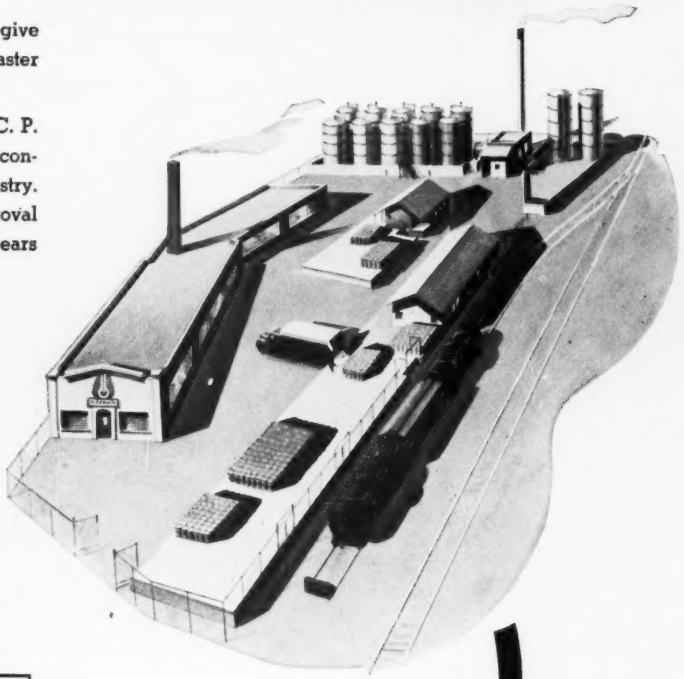
**at Bay Ave. and Wheeler Point Rd., Newark, N. J.**

## OPENS AUGUST 1ST

This new operation enables us to give eastern manufacturers better and faster service than ever.

The Newark expansion marks The C. P. Hall Company's thirty-first year of continuous service to the rubber industry. Your confidence in us and the approval given our products throughout the years justifies these added facilities.

In the Newark plant, as in all other C. P. Hall Company plants, we will stock our complete line of quality chemicals and compounding materials.



The C. P. Hall Co.
CHEMICAL MANUFACTURERS

**AKRON, OHIO • LOS ANGELES, CALIF. • CHICAGO, ILL. • NEWARK, NEW JERSEY**

# UNITED ROLLS

**For MILLS . . REFINERS . . . CRACKERS . . . CALENDERS . . . WASHERS**

**for processing RUBBER**

**PLASTICS . . . TILE**

**PAINT**

**LINOLEUM and other**

**NON-METALLIC MATERIALS**

Whatever your processing requirements, our almost 50 years of roll making experience can help you achieve maximum satisfaction.

*We'd like to prove it.*

UNITED ENGINEERING AND FOUNDRY COMPANY

**PITTSBURGH, PENNSYLVANIA**

***PLANTS AT***

**PITTSBURGH • VANDERGRIFT • NEW CASTLE**
**YOUNGSTOWN • CANTON**

***Subsidiaries:***

**Adamson United Company, Akron, Ohio**
**Lobdell United Company, Wilmington, Delaware**
**Stedman Foundry and Machine Company, Inc. Aurora, Indiana**

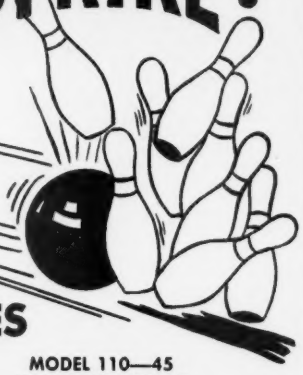
***Affiliates:***

**Davy and United Engineering Company, Ltd., Sheffield, England**
**Dominion Engineering Works, Ltd., Montreal, P. Q., Canada**
**S. E. C. I. M., Paris, France**

UE&FCO

REG. T.M.

# ANOTHER STRIKE!



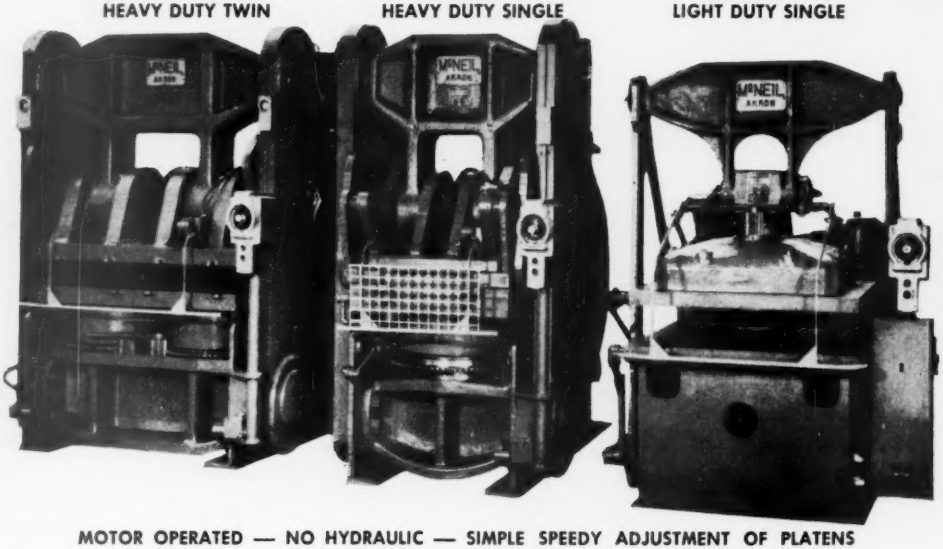
**IN BOWLING,**
WHEN A PLAYER MAKES
THREE CONSECUTIVE STRIKES, HE IS
SAID TO HAVE MADE A "TURKEY." WE AT
McNEIL HAVE ALSO MADE A "TURKEY" IN THESE THREE
MODELS OF OUR

## MECHANICAL GOODS PRESSES

**MODEL 800—24x24**
**HEAVY DUTY TWIN**

**MODEL 800—32**
**HEAVY DUTY SINGLE**

**MODEL 110—45**
**LIGHT DUTY SINGLE**




**MOTOR OPERATED — NO HYDRAULIC — SIMPLE SPEEDY ADJUSTMENT OF PLATENS**

- 800,000 pounds total pressure
- Two 24" x 24" drilled platens Individually adjustable 1" minimum—6" maximum
- 700 pounds per square inch platen pressure
- Adjustments for mold loadings—zero to 200 tons each mold position
- Two 24" x 24" molds may be used in same or different thicknesses or one 24" x 48" mold

- 800,000 pounds total pressure
- 32" x 32" drilled steam platens
- 780 pounds per square inch platen pressure
- Adjustments of mold loadings—zero to 400 tons
- Range of mold thickness, 1" minimum to 5" maximum or 2" minimum to 6" maximum

- 110,000 pounds total pressure
- 40" x 40" drilled steel steam platens
- 70 pounds per square inch platen pressure
- Adjustment of mold loadings—zero to 55 tons
- Range of mold thickness, 4" minimum to 9" maximum

MANUFACTURING AGENTS

GREAT BRITAIN—Francis Shaw & Co. Ltd., Manchester, England
AUSTRALIA and NEW ZEALAND—Vickers Ruwolt Proprietary, Ltd., Victoria, Australia.

## THE McNEIL MACHINE & ENGINEERING CO.

96 East Crosier St. Akron 11, Ohio

RUBBER WORKING MACHINERY • INDIVIDUAL CURING EQUIPMENT FOR TIRES, TUBES and MECHANICAL GOODS

# CHEMICAL USERS' GUIDE To General Chemical Products for the Rubber Industry

| PRODUCT | AVAILABLE FORMS | COMMERCIAL STRENGTHS | SHIPPING CONTAINERS | APPLICATIONS |
|---|---|---|---|---|
| Sulfuric Acid $H_2SO_4$ | Liquid | 60° Be (77.67%)<br>66° Be (93.19%) | Carboys<br>Steel Drums<br>Tank Trucks<br>Tank Transports<br>Tank Cars | Precipitant in synthetic rubber manufacture; manufacture of silica gel; reclaiming rubber. |
| Hydrochloric Acid<br>HCl + Water<br>*(Muriatic Acid)* | Liquid | 18° Be (27.92%)<br>20° Be (31.45%)<br>22° Be (35.21%) | Carboys<br>Tank Trucks<br>Tank Cars | Reclaiming Rubber. |
| Acetic Acid<br>$CH_3COOH$ + Water | Colorless Liquid | Various | Carboys, Barrels<br>Stainless Steel Drums<br>Tank Cars | Coagulant—latex. |
| Aqua Ammonia<br>$NH_4OH$ + Water<br>*(Ammonia)* | Colorless Liquid | 26° Be (29.4% $NH_3$) | Carboys<br>Steel Drums | Anti-coagulant—latex. |
| Aluminum Sulfate<br>$Al_2(SO_4)_3$ + approx. $14H_2O$<br>*(Alum)* | Commercial & Iron Free: Lump, Ground Powdered | 27°—37° Baumé<br>(Total $Al_2O_3$ 5.8—8.5%) | Multiwall Paper Bags<br>Bulk Carloads | Precipitant in synthetic rubber manufacture. |
| Aluminum Sulfate<br>$Al_2(SO_4)_3$ + Water<br>*(Liquid Alum)* | Liquid | 32° Be<br>(Total $Al_2O_3$ 7.2%) | Tank Trucks<br>Tank Cars | Precipitant in synthetic rubber manufacture. |
| Sodium Silicate<br>$Na_2O \cdot XSiO_2$ + Water<br>*(Silicate of Soda)* | Liquid | 38° to 52° Be<br>Various ratios of $Na_2SiO_2$ | Drums<br>Tank Trucks<br>Tank Cars | Thickener — latex; manufacture of silica gel; mold cleaning. |
| Sodium Bisulfite, Anhyd.<br>$Na_2S_2O_5$<br>*(Sodium Metabisulfite)* | White Powder | 97.5% $Na_2S_2O_5$<br>(Equiv. 65.7% $SO_2$) | Multiwall Paper Bags<br>Fibre Drums | Manufacture of butadiene. |
| Tetrasodium Pyrophosphate, Anhyd.<br>$Na_4P_2O_7$<br>*(TSPP) (Pyro)* | White Powder | 98% $Na_4P_2O_7$<br>(Equiv. 52.3% $P_2O_5$) | Multiwall Paper Bags | Manufacture of low temperature synthetic rubber. |
| Sulfur | Powder | 99.5% S | Multiwall Paper Bags<br>Barrels | Vulcanizing agent. |
| Zinc Nitrate<br>$Zn(NO_3)_2 \cdot 6H_2O$ | Colorless Crystal | 99%<br>$Zn(NO_3)_2 \cdot 6H_2O$ | Polyethylene Lined Fibre Drums | Coagulant—latex. |
| Ammonium Acetate<br>$NH_4C_2H_3O_2$ | Deliquescent Crystal | 96%<br>$NH_4C_2H_3O_2$ | Polyethylene Lined Fibre Drums | Manufacture of sponge rubber; control of viscosity—latex. |
| Boron Trifluoride | Gas | 98% Min. $BF_3$ | Pressure Cylinders | Polymerization Catalyst. |
| Boron Trifluoride Etherate | Liquid | 47.9% Min. $BF_3$ | Steel Drums<br>Tank Trucks<br>Tank Cars | Cyclicizing Catalyst. |

The products advertised are commercial chemicals having various uses, some of which may be covered by patents, and the user must accept full responsibility for compliance therewith.

**OTHER PRODUCTS: Metal Fluoborates for plating steel prior to coating with rubber**

**FOR THE LABORATORY OR SPECIAL APPLICATIONS: BAKER & ADAMSON REAGENTS and FINE CHEMICALS**

## GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

**40 Rector Street, New York 6, N. Y.**

*Offices:* Albany • Altanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte Chicago • Cleveland • Denver • Detroit • Houston • Jacksonville • Los Angeles • Minneapolis New York • Philadelphia • Pittsburgh • Providence • San Francisco • Seattle • St. Louis , Wenatchee and Yakima (Wash.)

In Wisconsin: General Chemical Company, Inc., Milwaukee, Wis.

**In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver**

# HERE IS A THREE-PART BANBURY FOR

The size 11 Banbury Mixer was originally designed for a top horsepower of 250 at 20 RPM. This was increased first to 300 HP at 20 RPM, then to 600 HP at 40 RPM and has now reached 800 HP at 40 RPM.

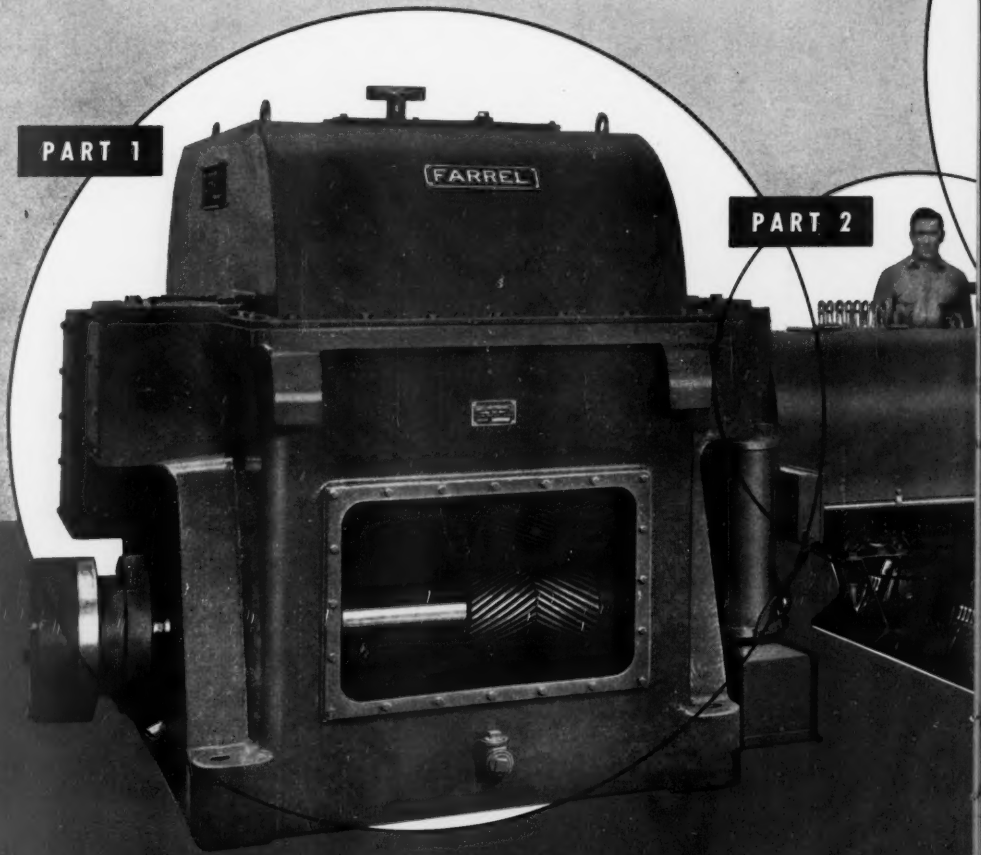
The need for a machine capable of taking the heavier loads resulting from mixing tougher stocks at higher speeds brought about the development of the new Size 11 Uni-drive Banbury — the three-part machine illustrated here.

**PART ONE**—The gears formerly mounted on the rotors are enclosed with the primary reduction gears in a separate housing, in which the gears and bearings are automatically lubricated. Smooth, efficient power transmission is provided under the heaviest torque loads. Service life is increased and maintenance of the gearing and other elements is reduced.

**PART TWO**—Smooth-operating universal spindles connect the Uni-drive with the Banbury rotors, transmitting power to each individually.

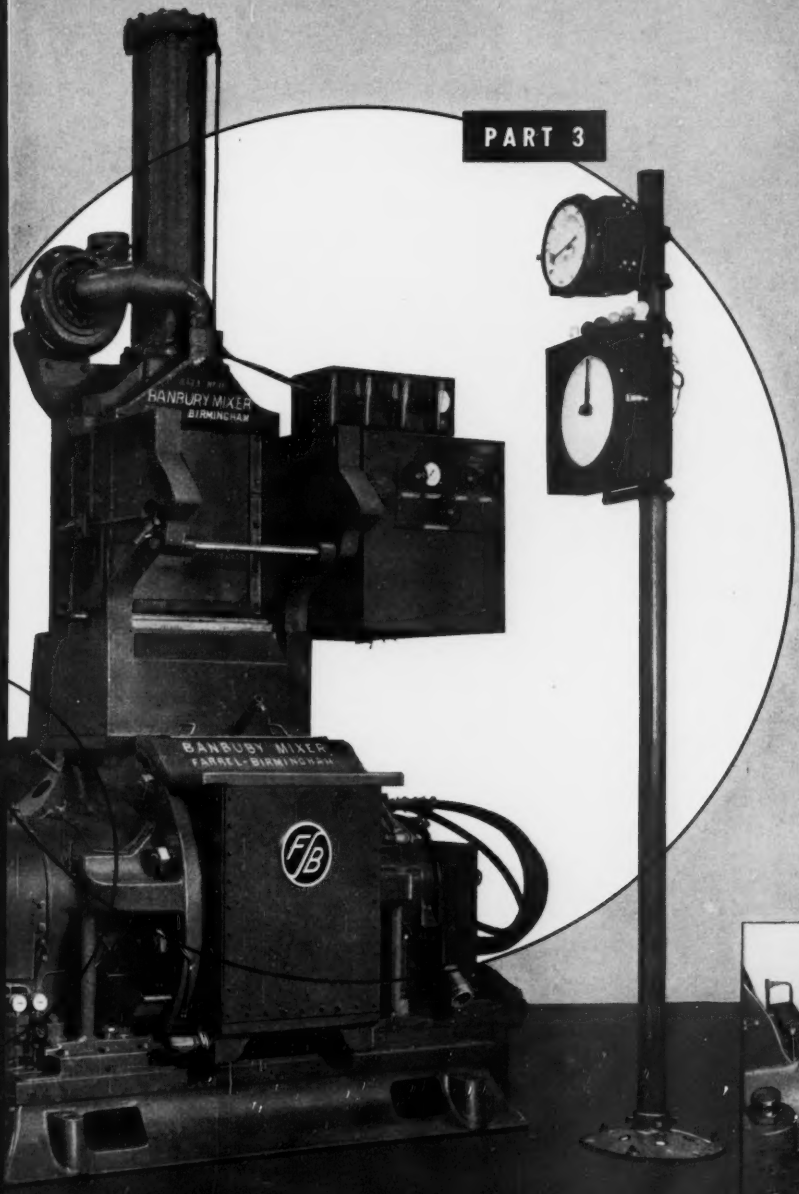
**PART THREE** — The Banbury Mixer itself has been strengthened, and new, harder materials are used for the working elements to withstand the more intensive work of mixing the stiffer stocks coming into use, and for the increasingly important application of devulcanizing and reclaiming rubber. Elimination of the gearing removes the severe strain formerly imposed directly on the machine from this source, decreasing wear and simplifying necessary maintenance and repairs.

The Uni-drive Banbury is now available in sizes 3A, 11 and 27. Existing installations of standard mixers can be converted to Uni-drive, usually in the same floor space. We shall be glad to supply full information on request—on new Banburys, repairing or altering old ones, or on any of the other production units listed.



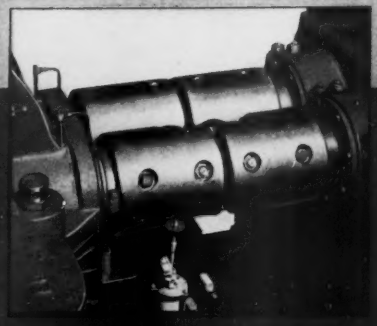
# MIXING STIFFER STOCKS AT HIGHER SPEEDS

PART 3




**F-B PRODUCTION UNITS**

- Banbury Mixers
- Plasticators
- Pelletizers
- Mixing, Grinding, Warming and Sheeting Mills
- Bale Cutters
- Tubing Machines
- Refiners
- Crackers
- Washers
- Hose Machines
- And Other Equipment for Processing Rubber and Plastics



Banbury mixers are designed to give smooth, efficient mixing uniformity

FARREL-BIRMINGHAM COMPANY, INC., ANSONIA, CONNECTICUT
Plants: Ansonia and Derby, Conn., Buffalo, New York
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Los Angeles, Houston

Farrel-Birmingham®

FB-559

# "DUTCH BOY"
# STABILIZERS
## for
# VINYL RESINS
*(Vinyl Chloride Polymers and Copolymers)*

Specifically designed to give your vinyl plastics maximum protection against *heat* and *light* aging.

Our technical staff will be glad to help solve your special problems. Write us for complete information.

### ADVANTAGES

- Maximum reactive lead content
- Tailored for specific needs
- Widely compatible with other compounding ingredients
- Economical
- Uniform quality

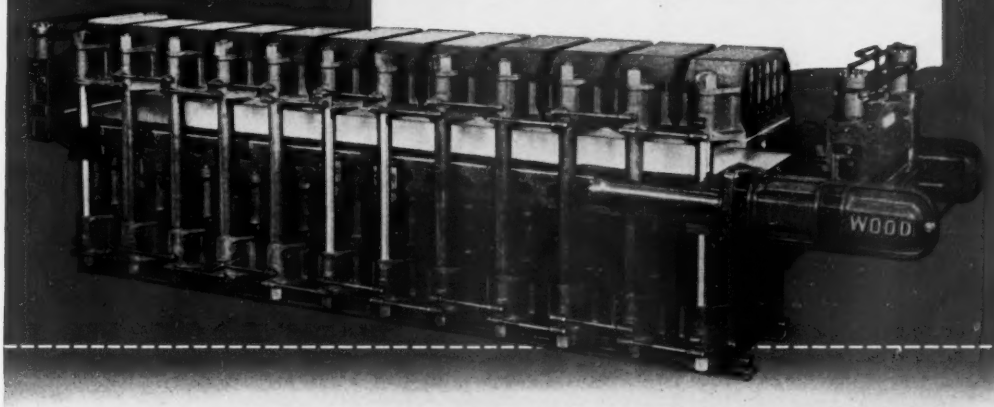
This chart describes some of our products and their uses

| TRADE NAME | CHEMICAL COMPOSITION | RECOMMENDED FOR USE IN | USE DATA |
|---|---|---|---|
| "Dutch Boy" Tribase | Tri-basic Lead Sulphate | Electrical compounds | Generally used in combination with DS-207. Works best with organic ester type plasticizers. |
| "Dutch Boy" Tribase E | Basic Lead Silicate Sulphate Complex | Insulated wire | Lowest volume cost stabilizer especially recommended for electrical compounds. |
| "Dutch Boy" DS-207 | Di-basic Lead Stearate | Sheeting, extrusion and molded compounds, i.e. insulated wire and vinyl phonograph records | Generally used with Plumb-O-Sil B and Tribase. Good for electricals. Adds lubricity and stabilization. Excellent alone as stabilizer and lubricant for rigid vinyl moldings. |
| "Dutch Boy" Plumb-O-Sil A | Co-precipitate of Lead Orthosilicate and Silica Gel | Sheeting and upholstery stocks | Easy processing. Gives a high degree of translucence. |
| "Dutch Boy" Plumb-O-Sil B | Co-precipitate of Lead Orthosilicate and Silica Gel | Translucent film and sheeting, belting | For translucent compounds and bright colors, minimizes spewing. |
| "Dutch Boy" Plumb-O-Sil B Electrical Grade | Co-precipitate of Lead Orthosilicate and Silica Gel | Insulated wire | Low volume cost, excellent electrical characteristics. |
| "Dutch Boy" Dythal | Di-basic Lead Phthalate | Electrical stocks and opaque films | General purpose stabilizer for heat and light. |
| "Dutch Boy" Dyphos | Di-basic Lead Phosphite | All opaque stocks including Plastisols and Organosols | Excellent for heat and light with organic ester and polymeric type plasticizers; anti-oxidant stabilizer; useful with chlorinated paraffin extenders. Generally used with DS-207. |
| "Dutch Boy" Normasal | Normal Lead Salicylate | Vinyl flooring compounds. Rubber stocks as non-scorch activator | Useful in small amounts with phosphate type plasticizer. Antioxidant stabilizer. |

"Dutch Boy" CHEMICALS

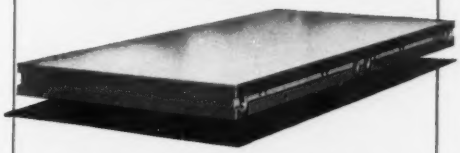
NATIONAL LEAD COMPANY, 111 Broadway, New York 6, N. Y.

# R. D. WOOD *Hydraulic* Belt Press




## ...FOR VULCANIZING RUBBER BELTING

### What makes this WOOD Press a Good Press?



**PART OF THE STORY...** is the R. D. Wood press platen, a piece of precision manufacturing. Practically any degree of parallelism required is maintained within the size ranges of 7' x 34' or 8' x 24'. Uniform heat distribution over top and bottom surfaces is achieved by precise drilling on special machines, carefully designed steam circulation channels. Finishes range from smooth tool to high polish, worked on specially processed fire box steel plate. Write for the full story.

THIS 3180 ton multiple-cylinder, single-opening hydraulic belt press vulcanizes rubber belting—quickly and efficiently. Hydraulic stretcher and clamping units, providing a force of 60 tons, are mounted at the ends of the moving platen to hold tension on the belt during processing. Equalizing devices insure parallel movement of the platen during full press stroke.

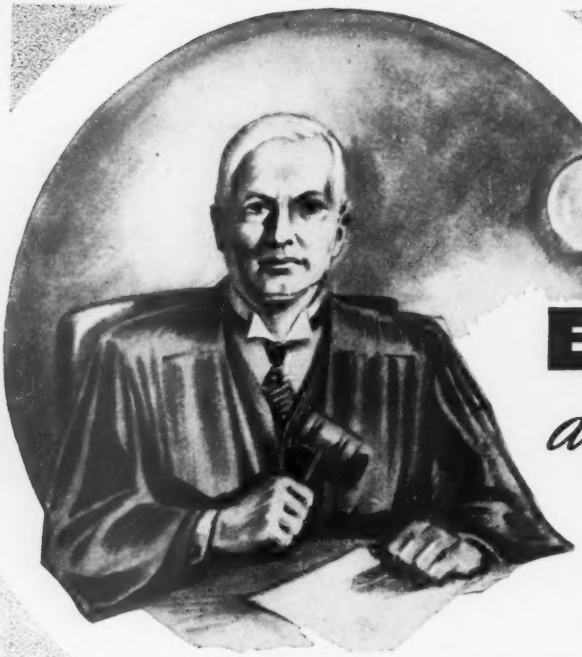
The 24 cylinders are arranged, with piping, into 12 2-cylinder units, any one of which can be cut out at any time, and which are interchangeable and removable without any other dismantling. Platen size is 63¼" x 30' x 3¾".

This press can be made in any size. Write for information.

HYDRAULIC PRESSES AND [illegible] FOR EVERY PURPOSE
ACCUMULATO[illegible]IFIERS

Est. 1803

R. D. Wood Company



# EVALUATE *and* JUDGE *THEN* RENDER A VERDICT...

## *on what* GLYCERIZED (LIQUID CONCENTRATE) LUBRICANT

## WILL DO FOR YOU

### *Investigate these* FACTS

Prevents adhesion of hot rubber slabs when piled . . . banishes dust nuisance by replacing soapstone or talc . . . prevents sticking during cure of extrusions and flat pan coiled tubing . . . excellent release agent for molds, mandrels, air bags, belt drums . . . equally satisfactory for washing and finishing inner tubes; imparts satiny finish . . . greatly aids in the processing of insulated wire and cable. The Production Departments and Laboratories of many rubber manufacturers, through years of using GLYCERIZED, give ample proof of its outstanding qualities as a lubricant for natural, synthetic and reclaimed stocks. Write for sample on your letterhead, then evaluate. You are the judge of the results.

Also Mfgrs. of

**RUBBEROL** AND **SYNTHOL** TWO OTHER FACTORY PROVED RUBBER PROCESSING AGENTS

QUALITY SINCE 1884

**GENSEKE BROTHERS**

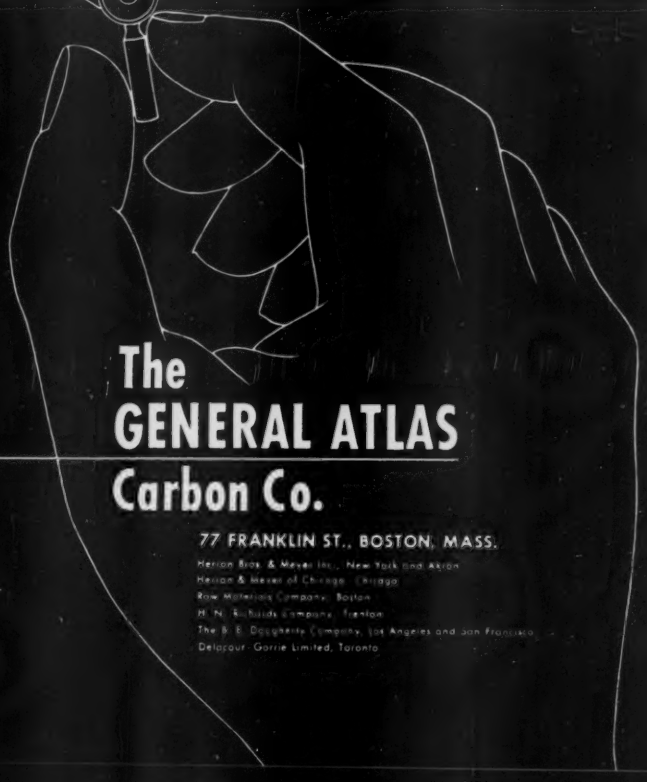
RUBBER MATERIALS DIVISION

West 48th Place and Whipple Street Chicago 32, U.S.A.

# PELLETEX

## The Carbon Black Standard of the Industry

for ✓ Rubber Properties
✓ Pellet Quality
✓ Uniformity
✓ Reliability

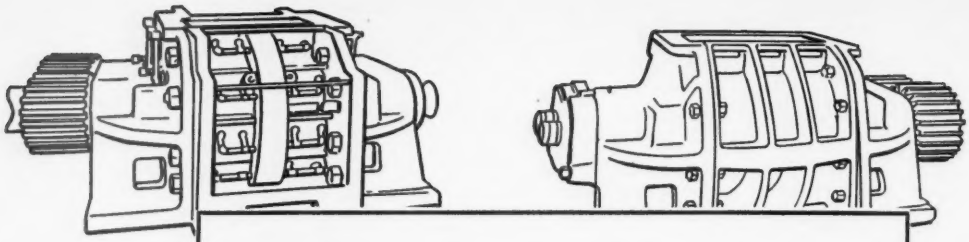


CABOT

The
GENERAL ATLAS
Carbon Co.

77 FRANKLIN ST., BOSTON, MASS.

Herron Bros. & Meyer Inc., New York and Akron
Herron & Meyer of Chicago, Chicago
Raw Materials Company, Boston
M. N. Richards Company, Trenton
The B. E. Daugherty Company, Los Angeles and San Francisco
Delapour-Gorrie Limited, Toronto



REBUILT BANBURY BODIES
READY FOR QUICK SHIPMENT

WE HAVE READY FOR QUICK DELIVERY TWO #9 BANBURY BODIES, SPRAY TYPE, WITH DOOR AND CYLINDER;— ALSO ONE 3A BODY. ALL COMPLETELY REBUILT, AND CARRYING OUR ABSOLUTE GUARANTEE. WILL SELL OUTRIGHT OR EXCHANGE FOR WORN BODIES. WIRE YOUR RESERVATIONS.

# *Faster* BANBURY REBUILDING SERVICE SAVES MANY $ IN PLANT COSTS

IF YOUR BANBURY is "limping" just give us a call.

Our production facilities have been greatly expanded, and we can give you remarkably quick service on completely rebuilding and hard-surfacing any size body, with every part restored to original dimensions, and efficiency.

On some sizes we are prepared to interchange with you almost immediately.

We guarantee every job. Interstate rebuilt Banburys are performing with perfect satisfaction in plants all over the United States. Our record in the past 16 years speaks more eloquently than words.

Our own plane is ready to fly a Banbury expert to your plant on short notice for consultation on any Banbury problem you may have.

Call, wire, or write us now, for a cost estimate. Time saved is money earned. Let us date you up for our "Pre-Plan" Banbury Rebuilding and Repairing Service.

## FREE To Banbury Owners

**To demonstrate the unequaled abrasion-resistant material we use in hard-surfacing rotors, rings, and mixing chamber, we will send FREE to any Banbury owner a unique tool you can make very useful in home or office. Just request on your company letterhead.**

SERVING THE RUBBER INDUSTRY

*EXCLUSIVE SPECIALISTS IN BANBURY MIXER REBUILDING*

## INTERSTATE WELDING SERVICE

Main Offices — Metropolitan Bldg., AKRON 8, OHIO Phone JE-7970

PLANTS AT ALLIANCE & AKRON

## CUSTOMERS BUY BY APPEARANCE TOO!

You *tell* them about the quality of the tires you make—but all they can see is what appears on the surface! That's one good reason for the almost universal use of Dow Corning Silicone Mold Release agents in the rubber industry—DC Mold Release Emulsions for molds and curing bags—DC Mold Release Fluid for bead and parting line release. They assure clean, easy release from clean molds, uniformly fine detail, closer tolerances and better finish —inside and out! They give you molded rubber goods with more sales appeal; they reduce scrap to an all-time low and cut mold maintenance costs by as much as 80%.

**SO SPECIFY**

**DOW CORNING SILICONE MOLD RELEASE AGENTS**

*Dow Corning Silicones Mean Business!*

*For more information write today for data sheet R-17*

**DOW CORNING CORPORATION, MIDLAND, MICHIGAN**

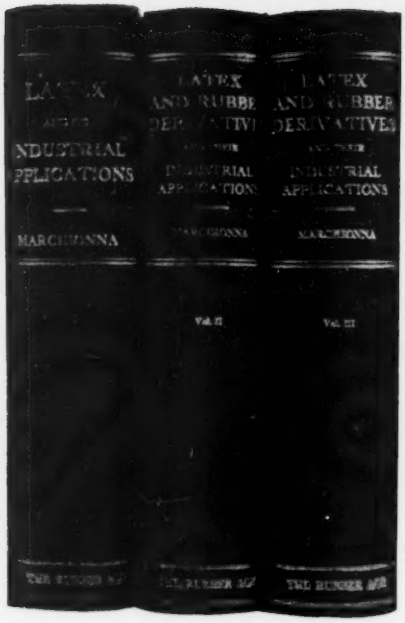
ATLANTA • CHICAGO • CLEVELAND • DALLAS • LOS ANGELES • NEW YORK

In Canada: Fiberglas Canada Ltd., Toronto
Great Britain: Albright and Wilson Ltd., London

*Dow Corning*
FIRST IN SILICONES

# *Still Available!*

Vols. II & III 6 x 9 inches
1670 Pages—Completely Indexed
New Low Price—**$10.00**
Vols. II & III ONLY
Volume I out of print




# LATEX AND RUBBER DERIVATIVES
## by Frederick Marchionna

**This valuable bibliography on Latex and Rubber Derivatives and their Industrial Applications is now being offered at a new low price of $10.00, the two-volume set (former price, $20.00).**

### THE TWO VOLUMES CONTAIN

- ABSTRACTS of all patents on Latex issued from July, 1932 to January, 1937 in the United States, England, France and Germany.
- ABSTRACTS of all patents on Derivatives from the earliest developments through January, 1937.
- ABSTRACTS of every essential technical article published during these same periods throughout the world—a total of almost 4000 abstracts.

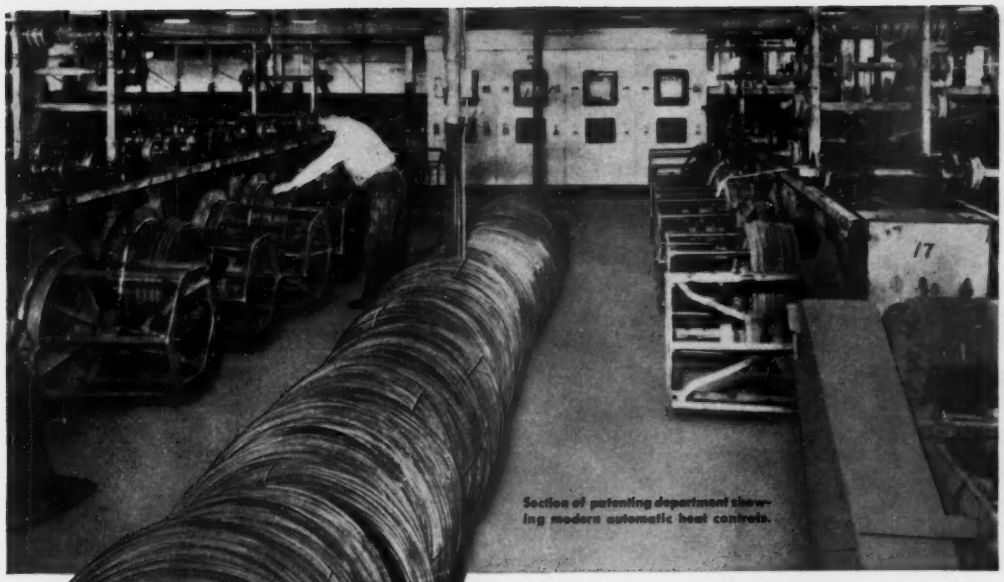
**As an added feature of great value, each chapter is supplemented by a complete summary of the subject covered, written by the author or other leading authorities, including such recognized experts as John McGavack, Philip Schidrowitz, C. L. Beal, D. F. Twiss, G. A. Richter, M. O. Schur, A. Szegvari, Harry L. Fisher, L. B. Sebrell and E. J. Morris.**

*New Low Price:* **$10.00 (POSTPAID)**

(Add 2% Sales Tax for copies mailed to N. Y. City)

PUBLISHED BY

**RUBBER AGE, 250 West 57th Street, New York 19, N. Y.**



Section of patenting department showing modern automatic heat controls.

# wire control

## *to save you money!*

• The accuracy with which your wire specifications are met, *and held,* quite naturally has an important bearing on the cost, speed and quality of your production. That's why you can profit by National-Standard's facilities and exceptional experience in producing special wire . . . either single or in fabricated braid and tape for tires and all other wire-in-rubber products.

Here, all phases of wire processing . . . drawing, cleaning, heat treating, plating, finishing . . . are controlled to a degree and accuracy never exceeded, not often equalled. It's a firmly rooted National-Standard policy that can save you time and money.

Remember, too, another National-Standard policy that can work to your advantage—highly qualified engineering service in the development and application of special wire to solve special problems. As always, it's yours for the asking.

NS
NATIONAL-STANDARD
Company
NILES, MICHIGAN

**DIVISIONS OF NATIONAL-STANDARD CO.**

| | |
|---|---|
| ATHENIA STEEL.. *Clifton, N. J.* | Flat, High Carbon, Cold Rolled Spring Steel |
| NATIONAL-STANDARD.. *Niles, Mich.* | Tire Wire, Fabricated Braids and Tape |
| WAGNER LITHO MACHINERY.. *Jersey City, N. J.* | Lithographing and Special Machinery |
| WORCESTER WIRE WORKS.. *Worcester, Mass.* | Round Steel Wire, Small Sizes |

# Suprex Clay

*. . . for low-cost*

*wear resistance*

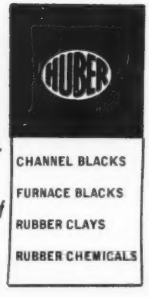
Compounders are sharpening their pencils these days to reduce costs while maintaining quality.

Suprex (hard) Clay—dependable for uniformity—can often be substituted in whole or in part for more expensive pigments without appreciable sacrifice of wear resistance.

For really highly loaded clay stocks which will process smoothly, Paragon (soft) Clay is the answer.

**J. M. HUBER CORPORATION,** *342 Madison Avenue, New York 17, N. Y.*

*Manufacturers of*



# RUBBER AGE

*One of the World's Outstanding Rubber Journals*

VOLUME 67
NUMBER 4



M. E. LERNER
*Editor*

B. J. KOTSHER
*Associate Editor*

JOSEPH H. JACOBSON
*Production Manager*

HARRIET K. COLE
*Circulation Manager*

CHARLES T. JANSEN
*Advertising Manager*

LOIS S. HOPKINS
*Asst. to Advertising Manager*

PETER P. PINTO
*General Manager*


## CONTENTS FOR JULY, 1950


Postwar Review of USF Rubber—*By J. McGavack and O. W. Lundstedt* ..... 431

Electric Power Distribution Systems for Small Rubber and Plastics Plants—*By B. D. Morgan and H. J. Finison*.... 437

A Call for More Reserves—*By Arthur Roberts*..... 443

Improvement of Dispersion of Benzothiazyl Disulfide in GR-S and Natural Rubber by Use of Fusion Mixtures with Sulfur—*By M. C. Throdahl*..... 445

New Process Prints Full Color Pictures on Rubber Surfaces 449


●

### REGULAR DEPARTMENTS


| | | | |
|---|---|---|---|
| Book Reviews ..... | 484 | Los Angeles News ..... | 473 |
| Canadian News ..... | 472 | Names in the News ..... | 466 |
| Chemical Prices ..... | * | New Equipment ..... | 476 |
| Classified Ads ..... | 500 | New Goods ..... | — |
| Coming Events ..... | 462 | Obituaries ..... | 474 |
| Editorials ..... | 450 | Rubber, Cotton Markets.. | 490 |
| Financial News ..... | 470 | Statistics ..... | 492 |


* Appears every other month

●


*Also Publishers of:*

RUBBER RED BOOK
Directory of the Rubber Industry
Published Biennially

ANNUAL BIBLIOGRAPHIES OF RUBBER LITERATURE
Compiled by D. E. Cable, Ph.D.
For Years 1935-1939

LATEX IN INDUSTRY (Out of Print)
By Royce J. Noble, Ph.D.
Text Book on Latex

LATEX AND ITS INDUSTRIAL APPLICATIONS (Vol. I) (Out of Print)
By Frederick Marchionna
Bibliography of latex patents and literature to June, 1932.

LATEX AND RUBBER DERIVATIVES AND THEIR INDUSTRIAL APPLICATIONS (Vols. II & III)
By Frederick Marchionna
Bibliography of latex patents and literature from June, 1932, to January, 1937; rubber derivatives to January, 1937.



Published on the 15th of each month by
PALMERTON PUBLISHING COMPANY, INC.

Printing Office,
East Stroudsburg, Pa.

Editorial and Advertising Offices,
250 West 57th St., New York 19, N. Y.

*New England Representative*—F. ROYAL CAREY, P.O. Box 133, Providence, R.I.
*Midwestern Representative*—JOHN P. O'KEEFE, 400 West Madison St., Chicago 6, Ill. Phone: Dearborn 2-2690.
*News Correspondents*—A. L. PICKARD, c/o Braun Corporation, 2260 East 15th St., Los Angeles 21, Calif. PHIL GLANZER, Tivoli Theatre Bldg., Toronto 1, Canada.

Entered as Second Class Matter, October 20, 1933, at the Post Office at East Stroudsburg, Pa., under Act of March 3, 1879. Subscription Rates: Domestic, $3.00 a year; Canada, $3.50; Foreign, $4.00. Single copies up to 3 months old, 35 cents; over 3 months old, 50 cents. Telephone COlumbus 5-2923, 5-2924.


Contents Copyrighted 1950 by the Palmerton Publishing Company, Inc.


Indexed in Industrial Arts Index and Engineering Index. OFFICERS: P. L. Palmerton, President; E. D. Osborn, Vice-President and Secretary; Peter P. Pinto, Treasurer.

***the SCORCH SEASON is here again***

***Stop processing losses with***

***Naugatuck Antiscorch***

***and Retarder***

***E-S-E-N***

- Retards Scorching at Processing Temperatures—but Shows Minimum Effect During Cure
- Used Effectively with all Types of Elastomers
- Used with all Types of Acceleration—Is Especially Effective with the Popular Combinations of Thiazoles and Guanidines and/or Thiurams
- Does Not Affect Physical Properties or Aging
- Is Effective in Small Quantities—from 0.25 to 1.00 Part on R. H. C. is Recommended
- Is Nondiscoloring and Nonstaining

**PROCESS – ACCELERATE – PROTECT with NAUGATUCK CHEMICALS**

Naugatuck Chemical

Division of United States Rubber Company

NAUGATUCK CONNECTICUT

In Canada: NAUGATUCK CHEMICALS DIVISION
Dominion Rubber Company Limited, Elmira, Ontario

RUBBER AGE

Vol. 67, No. 4 JULY, 1950

# Postwar Review of USF Rubber

By J. McGAVACK and O. W. LUNDSTEDT

*General Laboratories, United States Rubber Co., Passaic, N. J.*

SINCE the very start of preparation of plantation rubber the method has consisted of tapping rubber trees, collecting the latex, and adding acid to it in a few hours. The addition of acid causes coagulation of the rubber, which is processed through washing and sheeting mills and eventually dried at low temperatures. During the drying process the sheets may be smoked or not, depending upon whether a crepe or a smoked sheet is desired.

As freshly tapped latex remains in a dispersed form for only a few hours, it is necessary to go through this coagulation step every day. This means that if there is a variation in the total solids content of the latex from day to day, and generally such is the case, then the resultant rubber will vary in ash, nitrogen *(1)*, and other nonrubber constituents. Furthermore, since the addition of acid to a fresh latex causes coagulation to occur in a fairly short space of time, thus trapping acid and serum, the rubber is manipulated on iron mill rolls in order to wash out the acid and other soluble nonrubbers. This allows introduction of a small amount of iron and also does not permit thorough washing.

## Production of USF Rubber

Prior to World War II, the United States Rubber Company had developed in pilot scale a new type of crude rubber *(2)*. This was designed among other things to avoid the difficulties described above. In the first place, a preservative was added to the latex as soon as tapped so that it was not necessary to coagulate on the same day that the latex was collected. By the use of such a preservative the latex could be brought in each day and bulked so that the blended material had a uniform total solids content before coagulation. It must be remembered that the latex remained in the receiving or settling tank for one day before the upper ninety-five percent was drained off into the bulking tank, leaving the dirt and very small particle size latex in the bottom of the settling tank. This period of settling, bulking, and blending allowed the latex to be freed from extraneous bodies, such as bark, sand, and other dirt that may have gotten into the latex. By this method a clean latex was available to start with.

After five to ten days an amount of acid sufficient to bring the dispersion to pH 4.0 is added to the latex; instead of causing coagulation in a short time as would be expected, the latex is flocced or aggregated. It readily creams in a few hours and much of the water soluble serum constituents are removed by draining. If desired, the creamed flocs can be again diluted with fresh clean water, thoroughly washed in the dispersed state, and allowed to cream a second time, thus removing still more of the nonrubber constituents. The ease of creaming is shown in Fig. 1.

The washed rubber flocs are then heated by means of clean steam to a temperature of about 65°C., when

Note: This article is based on a talk presented by Dr. McGavack before the Rubber Division, Chemical Institute of Canada, Toronto, Canada, June 21, 1950.

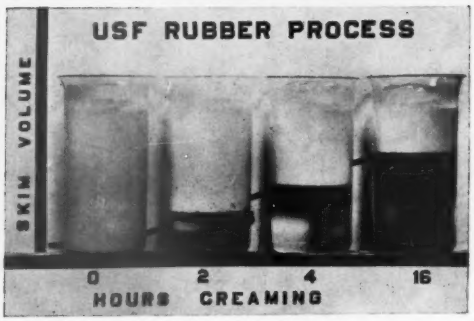



*FIG. 1—Ease of creaming USF rubber.*

the flocs coalesce to form a ribbon-like piece of coagulum as seen in Fig. 2. This ribbon is squeezed through rolls, and hung up immediately in the dry house without the necessity of being masticated for a long time on iron milling equipment in order to free it from non-rubber materials.

The importance of a uniform total solids content of the latex before coagulation is indicated in Fig. 3. Here it is shown that the nitrogen content of the resultant rubber is directly dependent upon the total solids content of the latex from which it is made.

As the preservative material is formaldehyde, the entire operation as described above is carried out under a reducing environment. This greatly reduces oxidation during the processing of the rubber. After drying, the rubber is compressed into a bale and may be shipped after wrapping in a sheet of the same material, or bareback if desired. The whole process is described in the flow sheet of Fig. 4.

Fig. 5 shows the settling, bulking, and flocculating tanks of a USF rubber pilot plant at successively lower levels. After the flocculated rubber particles are washed, they are transferred through the pipe leading to the left to ordinary sheet coagulating tanks for coalescence.

The more important characteristics of this type of rubber are: (a) extreme cleanliness; (b) softness—Mooney plasticity 70-75; (c) light color—as good as a first grade crepe; (d) uniformity in composition—nitrogen, ash and acetone extract; (e) high resistance to flex cracking, and (f) uniformity of cure.

All these characteristics are desirable and very attractive to the consumer. This rubber is again being produced in pilot plant amounts on our plantations and is being sold at a premium above No. 1 sheet. The uniformity and the advantages so clearly shown in our prewar material are being maintained in our postwar rubber on all counts.

*FIG. 2—Ribbon-like coagulum is squeezed through rolls and hung up immediately in the dry house.*

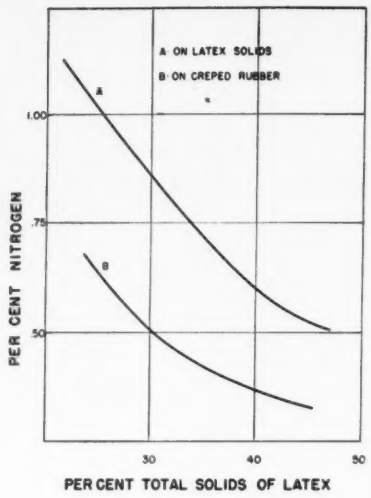



*FIG. 3—Dependence of nitrogen content upon total solids content of the latex.*

The uniformity of our postwar material is shown to some extent by the data in Table I where several recent shipments of our current material have been tested in the A.C.S. crude rubber formula.

As indicated in our first publication *(2)*, the milling characteristics of a USF tread mix show decreased power requirements and lower Mooney than is the case with smoked sheet used in the same formula. Results of current shipments are given in Table II.

TABLE I—CHARACTERISTICS OF CURRENT USF RUBBER

| | 2036 | 2036-3 | 2036-4 | 2046 |
|---|---|---|---|---|
| ML-4, 212° F. | 79(9) | 77(3) | 74(3) | 76(3) |
| % Ash | .18 | 0.15 | 0.15 | 0.15 |
| % Nitrogen | .36 | 0.38 | 0.41 | 0.41 |
| % Acetone Extract | 2.81 | 2.50 | 2.82 | 2.67 |
| A.C.S. Formula | | | | |
| Cure at 21 lbs. | | | | |
| 40 Minutes Tensile* | 2600 | 2510 | 2700 | 2680 |
| Elongation | 900 | 910 | 890 | 890 |
| 60 Minutes Tensile | 2850 | 2840 | 2950 | 3020 |
| Elongation | 880 | 890 | 880 | 870 |
| 80 Minutes Tensile | 2970 | 3180 | 3170 | 3160 |
| Elongation | 900 | 890 | 860 | 840 |
| 600% Modulus—Autographic | | | | |
| 40 Minutes | 575 | 575 | 660 | 640 |
| 60 Minutes | 700 | 635 | 775 | 810 |
| 80 Minutes | 725 | 750 | 840 | 875 |
| T-50 | | | | |
| 40 Minutes | +3.8 | +5.0 | +4.1 | +4.9 |
| 60 Minutes | —3.2 | —0.4 | —2.3 | —3.1 |
| 80 Minutes | —7.7 | —6.6 | —8.2 | —9.0 |

* Prewar Average 19 samples, 40 Minutes at 21 lbs. using 1.5 stearic acid in A.C.S. formula, gave 2695 psi.
( ) Age in months when measurement was made.

TABLE II—USF RUBBER COMPARED WITH SMOKED SHEET IN TREAD STOCKS

(Mixed in Size B Banbury)

| | RSS-A | RSS-B | USF-A | USF-B | USF+ Pepton |
|---|---|---|---|---|---|
| Cure, Minutes at 40 lbs. | 45 | 45 | 45 | 45 | 45 |
| T-50 | —4.8 | —4.5 | —5.0 | —6.2 | —6.4 |
| Abrasion Rating | 100 | 100 | 105 | 105 | 109 |
| DeMattia Flex (KC) | 161 | 164 | 196 | 237 | 170 |
| Torsional Hysteresis, 280° F. | 0.21 | 0.22 | 0.22 | 0.21 | 0.21 |
| Log (Electrical) Resistivity | 6.6 | 6.4 | 6.1 | 6.0 | 6.1 |
| Tensile (psi.) | 3900 | 3800 | 3950 | 3850 | 4250 |
| Elongation, % | 530 | 495 | 520 | 490 | 530 |
| 300% Modulus, psi. | 1750 | 1700 | 1800 | 2050 | 1900 |
| Shore Hardness | 61 | 62 | 64 | 64 | 63 |
| Banbury Mix ML-4, 212° F. at Start | — | 93 | 69 | 85 | 84 |
| ML-4, 212° F. at 8 Minutes | 55 | 59 | 50 | 49 | 44 |
| ML-4, 212° F. at 13 Minutes | 41 | 43 | 41 | 39 | 36 |
| Total Power (KW-Min.) | 20.1 | 19.6 | 18.1 | 16.4 | 15.7 |

In all laboratory abrasion results USF rubber has shown improvement in abrasion resistance as compared with smoked sheet, when the two rubbers were compounded and cured in the same manner. Preliminary road testing of eighty tires indicates that USF rubber is no worse in tread wear and shows considerable improvement in tread cracking as compared with smoked sheet.

In one factory comparison lasting over six months

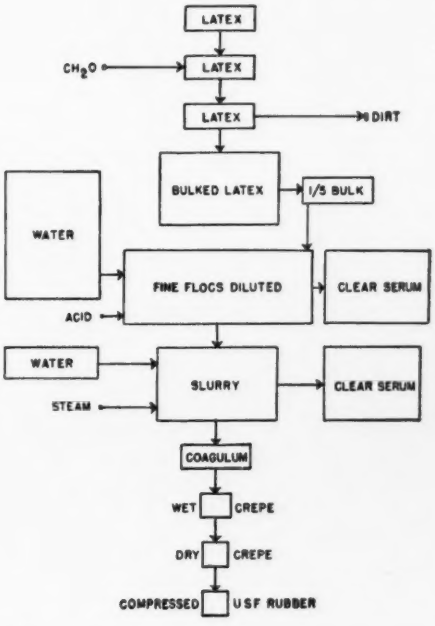



*FIG. 4—Flow sheet of USF rubber process.*

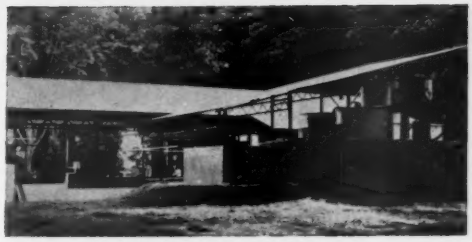


*FIG. 5—Settling, bulking and flocculating tanks of a USF rubber pilot plant.*

the percentage of calendered stocks rejected on account of dirt was reduced from ten percent to one-half of one percent by substituting USF rubber for No. 1 smoked sheet.

The clarity and color of USF rubber is clearly shown in Fig. 6. Here, calendered sheets 0.1 inches thick of smoked sheet, pale crepe, and USF rubber are photographed over a white background on which are printed their respective names. It can be used to advantage as a replacement for first quality crepes as, for example, in white sidewalls, transparent tubing, or light colored sundry stocks.

## Hardening of Rubber

Any discussion of Hevea rubber in the crude state would not be complete without some information as to its behavior on long storage. Generally speaking, if such a rubber is properly stored, that is, away from direct light, under relatively dry conditions, at moderate temperatures, with air circulation, and free from small amounts of copper, iron, and manganese, the life of the rubber is long. USF rubber is not an exception to this rule.

In contrast to this, unless extra precaution is taken by introducing antioxidants, the storage life of guayule rubber is considerably shortened due to the oxidation of that rubber and the subsequent lowering of its viscosity by inclusion of manganese, iron, or copper into the rubber from the leaves of the plant during its preparation. Even here, ways have been devised for preventing such trouble. We speak of these facts only for the purpose of trying to understand what happens to Hevea rubber during the normal aging period.

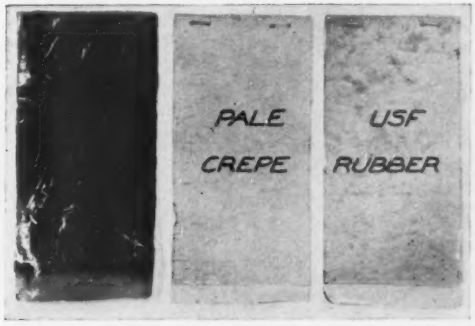



*FIG. 6—Comparison of color and clarity of three types of rubber (gauge, 0.100-inch).*

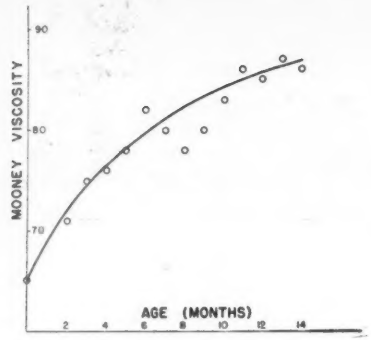



*FIG. 7—Hardening effect in USF rubber*

Hevea rubber when first tapped is generally soft. It will vary to some extent from clone to clone but has normally a Mooney when freshly tapped and coagulated, provided no extraneous materials have been added, of about 65 to 75 units. Smoking rubber, as in the preparation of sheet, increases its viscosity about 5 Mooney units. This difference was obtained from the average of 15 samples of smoked sheet made at different times and compared to 15 unsmoked sheet samples made from the same bulk latex at the same time. Smoking of USF rubber increases its viscosity but to a less degree than when regular sheet is smoked.

Aging of the rubber, even under good conditions as described above, causes the rubber to harden. It is believed that this hardening is due to crosslinking. The major percentage of hardening of smoked sheet occurs in the first few months in the life of the rubber. For example, we may consider the smoked sheet indicated in Table IV which had a Mooney of approximately 75 when first prepared and which when tested eight months later had a Mooney of 96. This, we believe, was due to the hardening process brought about by the two factors, smoking and aging. This hardening explains in part the reason we have such a wide range of Mooney values for smoked sheet bought on the open market.

These viscosity differences may also be influenced by the actual clone from which the rubber was prepared. So, in this paper, although our selection has been such that the Mooney values of the various rubber samples have not been too far apart, it is to be understood that smoked sheet may be sold on the market with Mooney ranging from 85 to 113. This rise in viscosity is generally brought about in the early life of the rubber.

In the same way, USF rubber will also harden with time; that is, the original Mooney before any work is done on the rubber generally increases during its early life. The maximum is never as high as smoked sheet and the rate of such increase is also very much less than for smoked sheet. Fig. 7 shows this hardening effect in USF rubber. In this graph there have been compiled the averages of eight samples of rubber stored in diffused light over a period of fourteen months. Several samples of this same rubber have been tested after nine years and show an average Mooney of 90, thus showing a very flat curve during the last seven years.

As a reference point on this figure is given the average Mooney value of eighteen samples of smoked sheet taken from different areas and clones and manufactured into sheet at the same time, with the same equipment, and smoked and dried in the same manner. The Mooney values were determined four months after the rubber was prepared. The average value is 96 as compared with 76 for USF rubber aged for the same time interval.

It is believed that this mild form of hardening can be eliminated with proper study. In other words, the normal process of aging of rubber causes hardening or probable crosslinking and if no metals or catalysts are present and the temperature is moderate, there should be no rapid, if any, deterioration of the rubber itself. However, when the temperature is raised by milling or otherwise, rapid breakdown of the rubber is encountered. Despite the slow hardening of USF, the greater ease of breakdown at elevated temperatures makes this less important than in the case of smoked sheet.

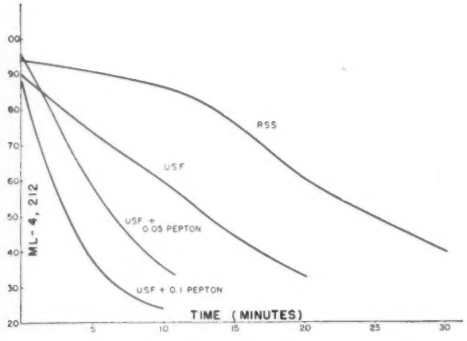



*FIG. 8—Change in Mooney with time of milling at 320°F.*

## Addition of Pepton

Another new development in the field of crude rubber has been brought about by the addition of certain catalytic softening agents to the latex prior to its coagulation. A number of such materials have been tried. One of these materials which seems to have a great deal of practical promise is known as Pepton 22. This material may be added to the latex, the rubber coagulated and properly prepared either as a sheet, as a crepe, or as USF rubber, and for all intents and purposes the rubber handles and ships the same as if the Pepton had not been added. However, if any one of the three rubbers is put in a hot Banbury or on a hot mill then the Pepton-treated rubber softens very rapidly, much more rapidly than when no Pepton is present.

Savings by the use of small amounts of this material are in the neighborhood of 30% in both time and power. In other words, this softener allows the rubber to be shipped in the usual form without increased distortion

TABLE III—EFFECT OF HEATING AT 275° F. FOR 1 HOUR IN AIR ON MOONEY VISCOSITY

| | Smoked Sheet | USF Rubber | Smoked Sheet plus Pepton * | USF plus Pepton † |
|---|---|---|---|---|
| Unheated | 94 | 74 | 99 | 73 |
| Heated | 96 | 56 | 25 | 13 |

* .15% Pepton. † .08% Pepton.

TABLE IV—COMPARISON OF SMOKED SHEET AND USF RUBBER FROM SAME LATEX

(ML-4 After Milling at 320° F.)

| Minutes | 0 | 5 | 7.5 | 15 | 22 | 30 |
|---|---|---|---|---|---|---|
| USF (2053) | 86 | 58 | 46 | 27 | 17 | — |
| Smoked Sheet (2052) | 96 | 89 | 85 | 58 | 40 | 29 |

and to still exert its softening influence when the rubber is milled. It also does not cause discoloration.

The effectiveness of Pepton in USF rubber can be shown by the following data. Samples of both smoked sheet and USF rubber to which a small amount of Pepton has been added in the latex form before manufacturing have been cut to about ⅛-inch thickness and exposed to air at 135°C. for one hour. Mooneys of both of these rubbers before and after the heat treatment are recorded in Table III.

Tread stocks have also been prepared using the USF rubber and USF rubber plus Pepton and both compared with smoked sheet in a standard tread formula as shown in Table II. These data show that Pepton is not harmful to rubber compounding.

## Breakdown of USF Rubber

More complete information as to the relative ease of breakdown of smoked sheet and USF rubber, with and without Pepton, is clearly brought out in Figs. 8, 9, and 10. The data shown in all of these figures have been taken from breakdown curves on a 6 x 12-inch laboratory rubber mill, using a nip of .075-inch, a front roll speed of 20.7 rpm., and a back roll speed of 27.2 rpm. The charge was 500 grams. The temperatures recorded were those obtained directly on the stock. Mill roll temperatures were adjusted to keep the stock temperatures as near constant as possible.

Fig. 8 gives the breakdown curves for some experiments carried out at a temperature of 320°F. These not only show the more rapid breakdown of USF rubber as compared to smoked sheet, but also indicate how the breakdown of the latter is considerably accelerated at this temperature by the addition of even small amounts of Pepton.

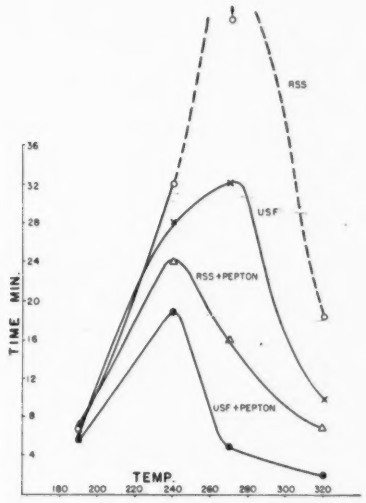



*FIG. 9—Time to drop of 30 Mooney versus temperature.*

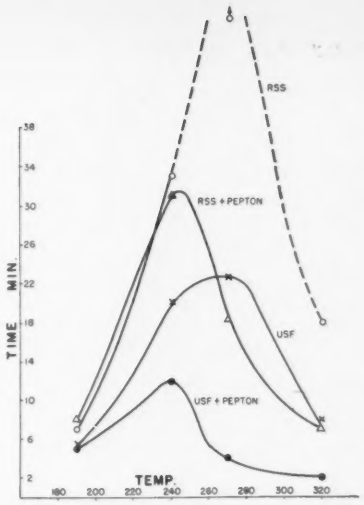



*FIG. 10—Time to Mooney = 65 versus temperature.*

In Fig. 9 the temperature of the breakdown has been plotted against the time necessary to reduce the Mooney viscosity thirty points below the original for each of the rubbers. This shows clearly the differences in breakdown between smoked sheet and USF rubber, with and without Pepton. It can be noted that breakdown at 190°F. is practically independent of the rubber used, or the addition of Pepton. There are real differences at 240°F., and extremely wide differences at 270°F. In fact, at this temperature the Mooney of the untreated smoked sheet sample had not been lowered 30 points even after several hours on the mill. The untreated USF rubber, on the other hand, although slower to break down at this temperature than at any other tried, did drop 30 Mooney points in 32 minutes. At still higher temperatures the rate of breakdown increased rapidly. It can be noted that both the Pepton-treated rubbers softened more rapidly than the analogues without Pepton at temperatures above 240°F., indicating the effectiveness of Pepton at these temperatures.

Fig. 10 brings out the relative ease of breakdown of these two rubbers in a little bit different manner. In this graph the time to reach 65 Mooney is plotted against temperature. Here again, it is shown that there is not too great a difference in this milling time when the milling temperature is 190°F. but as the temperature increases, variation between the rubbers also increases greatly.

The great difficulty of softening smoked sheet at temperatures around 270° F. is also noted here. Although this temperature also shows a minimum in breakdown for USF rubber, it nevertheless does break down. Again, when Pepton is added, both rubbers soften rapidly after the 240°F. point is reached.

It can be seen that by the use of USF rubber or USF rubber plus Pepton, advantages over smoked sheet are gained in time of breakdown, ease of compounding, and

less damage from scorch. The same advantages are true when USF is compared with pale crepe.

### Smoked Sheet and USF Rubber from Same Latex

The great difference in the breakdown of USF rubber and smoked sheet is clearly brought out in Table IV. In this case two rubbers were prepared from the same bulk latex, tapped on the same day, and processed by the two different methods by which these rubbers are made. Since the data as presented here were obtained on the rubbers after an eight month interval, the Mooneys before any breakdown in both cases are somewhat higher than when the rubbers were first prepared. The data in this table show distinctly the differences that result from processing the same latex by the two different methods. The reason for this difference we believe is partially on account of the smoking in one case, the variation of the amount of serum constituents removed by the two processes, and the use of formaldehyde as a preservative in the case of USF rubber.

### Summary

The basic difference between USF rubber and market grade crudes lies in the effective preservation by formaldehyde of the rubber hydrocarbon in its original unspoiled condition throughout the entire period of preparation. This method of preservation prevents damaging microorganism or oxidative actions. Thus the formaldehyde treatment retards the rapid changes in various properties observed in ordinary sheet or crepe during and after shipment.

USF rubber is soft and shows increased flexing life. These properties are obtained by the use of formaldehyde, by the reduction in manipulation on the heavy creping mills, and by elimination of smoking. By following these procedures, damage to the rubber hydrocarbon is prevented.

USF rubber is clean because the latex is strained as usual and is further purified by sedimentation. This crude rubber is uniform and light in color because of the preservation treatment, the blending of the latex, the thorough washing of the flocs, and the elimination of smoking.

The addition of Pepton still further enhances the workability of USF rubber.

Because of the greater purity of USF rubber, for every pound purchased one percent more of rubber hydrocarbon is available than in first grade sheet.

ACKNOWLEDGMENT

The authors wish to express their appreciation to Messrs. C. E. Rhines and E. M. Bevilacqua of the General Laboratories and to Dr. W. E. Cake and to the staff on the United States Rubber Plantations for their cooperation; also to recognize Mr. C. E. Linscott (deceased) for help in some of the experimental work outlined in this paper.

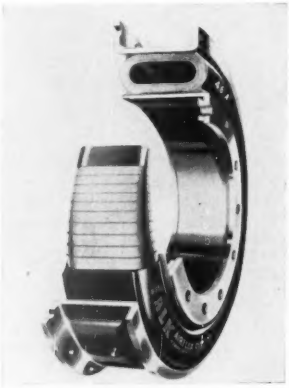
LITERATURE REFERENCES

(1) McGavack, J., and Rhines, C. E., *Ind. Eng. Chem.*, Vol. 32, p. 1072 (1940).

(2) McGavack, J., Linscott, C. E. and Haefele, J. W., *Ind. Eng. Chem.*, Vol. 34, p. 1335 (1942).

## Falk Airflex Coupling

Redesigned after 10 years of successful service in coupling applications, the Airflex Coupling produced by the Falk Corp., Milwaukee 8, Wisc., has increased torque capacity 20% above previously published values. The hubs and adaptor plates have been redesigned to



facilitate disconnection and removal of the entire gland assembly. Redesigned components are completely interchangeable with the equivalent components of all Airflex Couplings now in use and standard parts may be combined to allow six different mounting arrangements including flange mountings on a flywheel. This coupling is designed primarily for engine drives and for applications involving extremely severe torque fluctuations.

## Super-Sensitive Electronic Control

An electronic control instrument for industrial applications which is sensitive to temperature changes as small as one-tenth of one degree has been developed by the Minneapolis-Honeywell Regulator Co., Philadelphia 44, Penna. Designated the No. 007 electronic control, the instrument will control industrial processing temperatures in which the temperature range is between 20° below zero and 300° above. The unit is immune to vibration, dust and dampness and, where both control and a record is required, may be used with recording or indicating instruments.

---

Seely Instrument Co., Inc., Niagara Falls, N. Y., has announced a larger size valve designated at **2½ - 3½-inch Series 805.** The valve is air pilot operated and is valuable for use in controlling hydraulic cylinder operated machinery which is operated from low pressure to produce long strokes economically followed by the application of high pressure from 2,000 to 5,000 psi.

---

Beckett-Harcum Co., Wilmington, Ohio, has developed the **Hi-Cyclic Air Valve** designed for the control of automatic and semi-automatic labor saving machinery. The valve functions the same as any operating valve, but in addition, will control the stroke of an air cylinder within .001-inch and stop and return the stroke at any point without overtravel.

---

The **Pneumatic Capacilog,** a new, air-operated strip chart recorder, has been developed by the Wheelco Instruments Co., 847 West Harrison St., Chicago 7, Ill. The unit is completely self-contained and has only two external air connections.

# Electric Power Distribution Systems for Small Rubber and Plastics Plants

**B. D. MORGAN*** and **H. J. FINISON**
*Johnson & Johnson, New Brunswick, N. J.* *General Electric Co., Schenectady, N. Y.*

IN LAYING OUT the electrical distribution system for the new adhesive plaster plant of Johnson & Johnson at New Brunswick, N. J., there were a number of questions on which those concerned, including the authors, found widely varied answers in the rubber and electrical industries. In many cases we found that in order to find the correct answer we would have had to make a complete engineering and economic study. Yet, an extensive study did not appear justified for a single plant.

There are no doubt many instances where the designer of a small plant cannot afford to spend the necessary time in making an accurate cost study before selecting his distribution system. However, by grouping one type of plant it was felt that some useful information might be brought together that could be used in the design of many plants.

## Typical Plants

Our investigation indicated that there were three plants each producing an entirely different product yet having the same basic electric power distribution problems. These three plants and their processes are as follows:

Vinyl Sheeting Plant: The major equipment in this plant consists of a No. 3A Banbury, a sheeting mill, and a calender. Assuming that there are no finishing operations, this is about the extent of the power except for plant services and lights.

Adhesive Plaster Plant: The heavy processing equipment in this plant consists of a No. 9 Banbury, a sheeting mill, four feeding mills, and a calender range. Although everything is slightly larger, the electrical distribution problems are basically the same since the relative locations are about the same and the loads are of a similar nature.

Small Rubber Tire Plant: Equipment for this plant includes a No. 11 Banbury, a sheeting mill, four large feeding mills, and a large intricate calender range complete with fabric and ply dipping equipment. Again the power distribution problems are the same for although the calender range is large and complicated the power comes mainly from one large motor generator set. (Note: Although to the large tire manufacturers this ranks as a "miniature" plant, it represented the largest in our study).

Since these above plants of varying sizes have similar problems we can make a general study that will benefit anyone recommending electric power equipment for plants of this type. Our assumptions are as follows: (1) Banburys or similar internal intensive mixers will do most of the mixing; (2) The mixing, feeding and calendering equipment will be located adjacent to each other, and (3) Adjustable voltage drives with individual motor generator sets will be used for all calenders.

Characteristic of the electrical loads of both the rubber and plastics industries are the several large driving motors for these stock processing machines. The motors range in size from 75 to 800 hp and are concentrated in a comparatively small plant area. Table I shows typical horsepower rating for the three hypothetical plants described above.

Beyond the primary processing sections of these plants are the finishing, storage, and service areas. The finishing departments represent wide differences, especially in the three cases which we have laid out. They range from almost nothing in the case of the vinyl film plant to a large area requiring tire building and curing equipment in the case of the rubber plant. Electrical loads may range from 1 to 3 volt-amperes per square foot for lighting to 10 to 15 volt-amperes per square foot for lighting and power for finishing machinery.

Since the finishing areas have small electrical loads distributed over comparatively larger areas, the problems are somewhat typical of electrical supply problems for general manufacturing areas in other industries. And similar to other industries, the finishing areas may be supplied at 460 volts by unit substations in the particular load areas *(1)*.

## Voltage Selection

*Distribution System Problems:* While the purpose of this paper is to discuss generally power distribution systems for the small rubber and plastics plant, a major part of it is devoted to selection of voltage. Proper choice of voltage can be an important factor in achieving a low cost, flexible electric power system.

TABLE I—TYPICAL COMBINATIONS OF RUBBER MILL MOTORS
(Figures Given are Horsepower Rating)

| | Vinyl Plant | Adhesive Plant | Rubber Plant |
|---|---|---|---|
| Banbury Size | 3A | 9 | 11 |
| Banbury | 150/300 | 200/400 | 300/600 |
| Sheeting Mill | 100 | 150 | 200 |
| Warm-up Mill (If Twin Unit) | 2–75 | 2–125 | 2–200 |
| Calender (MG Set Motor Drive) | 150 | 250 | 300 |
| or | | | |
| Calender | 100 | 150 | 200 |
| + | | | |
| Tuber | 50 | 100 | 125 |

Note: These values are based on future trends. They would apply to plants as designed today and will not necessarily apply closely to existing plants.

Note: This article is based on a joint paper presented by the authors at the Conference on Electrical Engineering Problems in the Rubber and Plastics Industries, sponsored by the American Institute of Electrical Engineers, at Akron, Ohio, April 20, 1948.

* Present address: Behr-Manning Corp., Troy, N. Y.

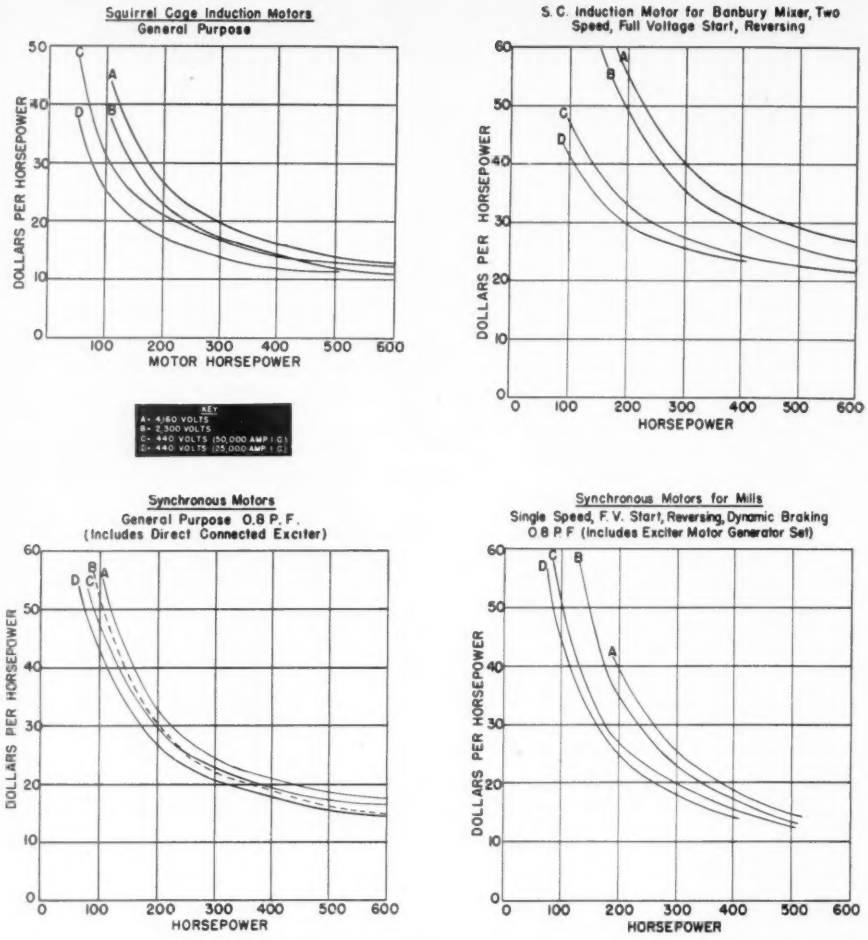



*FIG. 1—Approximate price of various motors and controls.*

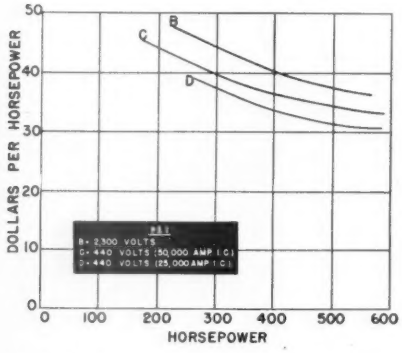



*FIG. 2—Approximate price of wound rotor induction motors for Banbury (two speed, secondary resistance start, reversing).*

For many rubber or plastics plants, the large motors could be rated at 440, 2300 or 4160 volts. The finishing areas will usually require 460 volts for small power and a lower voltage for lighting *(2)*. But, if there are large finishing areas involved, power supply to the load areas will need to be at a higher voltage in order to achieve good economy.

*Cost of Motors and Control:* One of the major factors in determining voltage will be the cost of the large motors and of their control. In our study we assumed that the type of motors shown in Table II would be used for the various processing machines. Estimated prices for these motors and control are given in Figs. 1 and 2.

The control equipment assumed for the estimates are complete metal enclosed factory assembled equipments. The 440 volt control has drawout air circuit breakers and the 2300 and 4160 volt equipments have current limiting fuses. Air break contactors are used for all voltages. All necessary devices and instruments to accomplish the control functions indicated in Table II

TABLE II—TYPICAL MOTOR TYPES FOR RUBBER PROCESSING MACHINES

| Item | Power Supply | Motor Type | Speeds | Control |
|---|---|---|---|---|
| Banbury Mixer ..... | Stiff | Induction—Squirrel Cage | 2 | Full voltage start—Reversing |
| Banbury Mixer ..... | Weak | Induction—Wound Rotor | 2 | Secondary resistance start—Reversing |
| Mills ..... | Stiff | Synchronous | 1 | Full voltage start—Reversing—Dynamic braking |
| Mills ..... | Weak | Induction—Wound Rotor | 1 | Secondary resistance start—Reversing—Plugging |
| Calender MG-Set .... | Stiff | Synchronous or Squirrel Cage | 1 | Full voltage start |
| Calender MG-Set .... | Weak | Synchronous or Squirrel Cage | 1 | Reduced voltage start |

are included. A bus to interconnect the several equipments in any one line-up of control is also included. For the general-purpose induction and synchronous motors (used for calender MG-set drive, pumps, compressors, etc.) there is little difference between the low-voltage and high-voltage motors and control for motors above 200 horsepower. For the motors for the Banbury mixer and the mills, 440 volt motors show low cost up to 500 horsepower.

Of course, this is only one factor in the total system costs and further influences must be considered before a voltage is selected.

*Voltage Dip:* Wherever the large processing motors are operated at a voltage different from the electric utility supply voltage, voltage dip on motor starting will be a serious problem for the small rubber or plastics plant. The magnitude of voltage dip will mostly depend on the size of the supply transformers. This is illustrated in Fig. 3 which makes the following assumptions:

(1) Scale of motor hp is based on the starting current being equal to approximately 5.5 times normal.

(2) Short-circuit kva of primary supply is assumed to be as follows:

| Bank KVA | Primary Short-circuit KVA |
|---|---|
| 10- 300 | 25,000 |
| 500- 1000 | 50,000 |
| 1500- 3000 | 100,000 |
| 3760-10000 | 250,000 |

(3) Transformer impedances are assumed to be as follows:

| Bank KVA | Bank Impedance |
|---|---|
| 10- 50 | 3% |
| 75- 150 | 4% |
| 200- 500 | 5% |
| 750- 2000 | 5.5% |
| 3000-10000 | 6.0% |

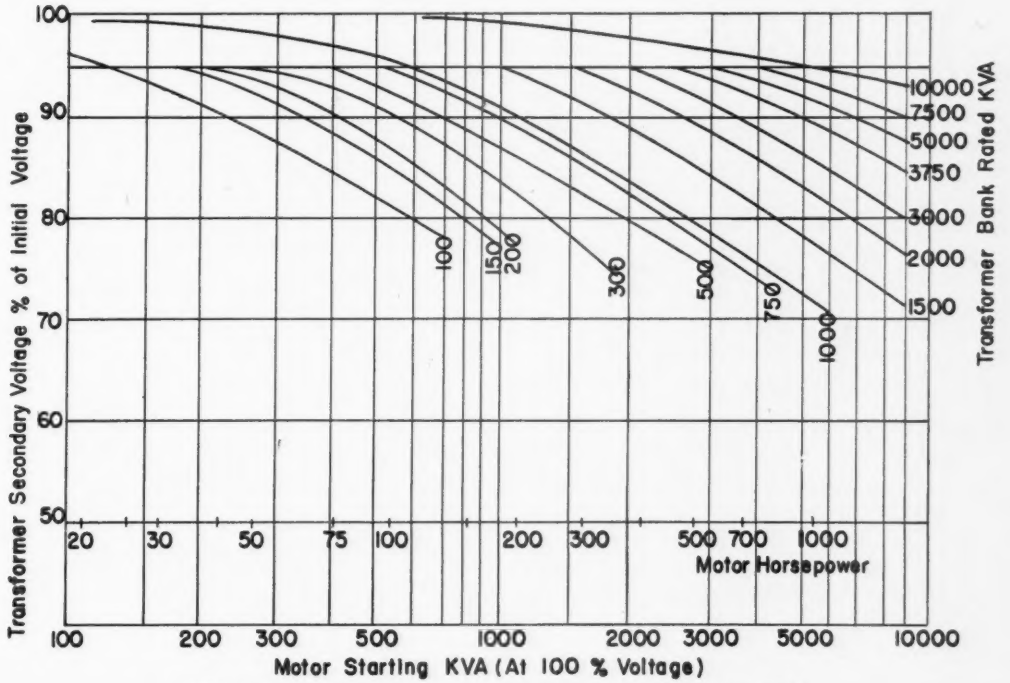



*FIG. 3—Transformer secondary voltage on motor starting (full voltage).*

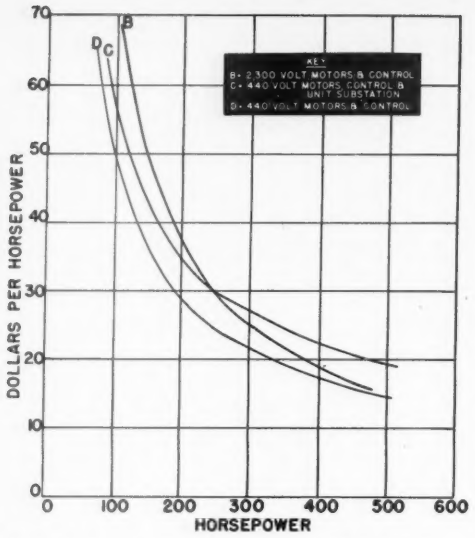



*FIG. 4—Comparison of costs of 2300 volt motors and control with 440 volt motors supplied by a unit substation (synchronous motor for mills).*

Since the usual supply capacity requirements for the small rubber and plastics plant will be from 1000 to 5000 kva, voltage dips on starting motors up to 600 or 800 horsepower may be appreciable.

Where lighting is supplied from the same source transformer as the large motors, the maximum permissable voltage dip will be only 3 to 5 percent. Even where lights are not supplied from the same source as the motors, large voltage dip may still not be permissible. Machines such as Banbury mixers and rubber mills have high torque requirements for both starting and running. Since the starting torque of both synchronous and induction motors decreases as the square of voltage, starting torque deficiencies may be encountered if excessive voltage dips are allowed. For these motors use of reduced voltage starting cannot aid in reducing voltage dip because of corresponding reduction in starting torque. Use of wound rotor motors may be required but as shown by Fig. 2 they are more costly than synchronous or induction motors with full voltage starting.

A still additional limit on voltage dip or motor starting current may occasionally be experienced where the plant is supplied from electric utility lines of limited capacity. Here the utility may establish limits in order not to permit adverse voltage disturbances for other customers supplied from the same lines.

*Short-Circuit Protection:* For 2300 or 4160 volt systems in the small rubber or plastics plant, short-circuit currents will usually not be a problem. Circuit breakers of 50,000 kva interrupting rating are applicable for supply transformer capacity up to 2500 kva and 100,000 kva interrupting rating up to 5000 kva capacity. Motor control equipments with current limiting fuses usually have interrupting ratings of 150,000 kva at 2300 volts and 250,000 kva at 4160 volts.

Limitations on the allowable short-circuit current are as follows:

(1) Panelboards and Plug-In Bus—These will be used mostly in the finishing areas but also for small power in the stock processing areas. Protective devices for these are available up to 25,000 amp interrupting rating although the price of circuit breakers of 15,000 amp interrupting rating is appreciably lower. The 15,000 and 25,000 amp levels are obtained with unit substations of 500 and 750 kva respectively.

(2) Circuit Breakers for Feeder and Motor Circuits—The cost of a circuit breaker increases as the interrupting rating increases. For a metal enclosed equipment drawout circuit breaker the prices are roughly $400 for 15,000 amp interrupting rating, $700 for 25,000 amp, and $1100 to $1300 for 50,000 amp. A unit substation capacity up to 1500 kva will keep within the 50,000 amp duty although application of the 50,000 amp feeder circuit breaker could be extended to larger supply capacity by cascade operation *(3)*. Unit substations larger than 1500 kva are seldom economical for general manufacturing areas due to high costs of low voltage cable but are here considered for a concentrated rubber mill load. Recognition must be given that cascade operation does not permit achieving selectivity between main and feeder circuit breakers and hence some reliability is sacrificed.

From these brief discussions of short circuit currents, we can see the inherent problems in adopting 440 volt supply for large concentrations of power and the relative freedom in application permitted by 2300 or 4160 volts.

*Availability of Utilization Equipment:* Motors are most readily available for voltage ratings of 220, 440 or 2300. Power supply systems are appreciably more costly at 220 volts and hence this voltage will not often be considered for the small rubber or plastics plants. While 550 volts has been used in rubber plants, this voltage is not widely used in industry, and hence equipment is not as readily available as for 440 volts.

Similarly, 2300 volt motors are more readily available than 4160 volt motors. However, there is some trend toward greater use of 4160 volts in plants where there are few large motors and the better economy of 4160 volts as a distribution voltage offsets the higher cost of the 4160 volt motors.

## Study of Typical Plants

The general character of the electric power distribution system that will be adopted for the small rubber or

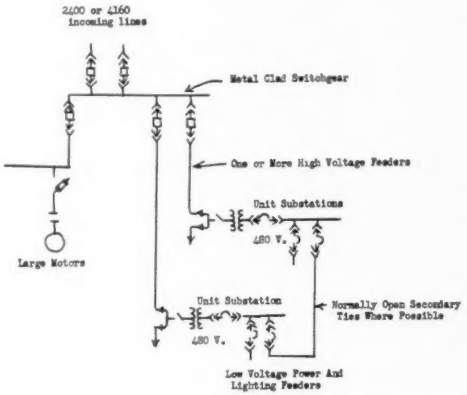



*FIG. 5—Suggested power system arrangement for power supply below 5 kv.*

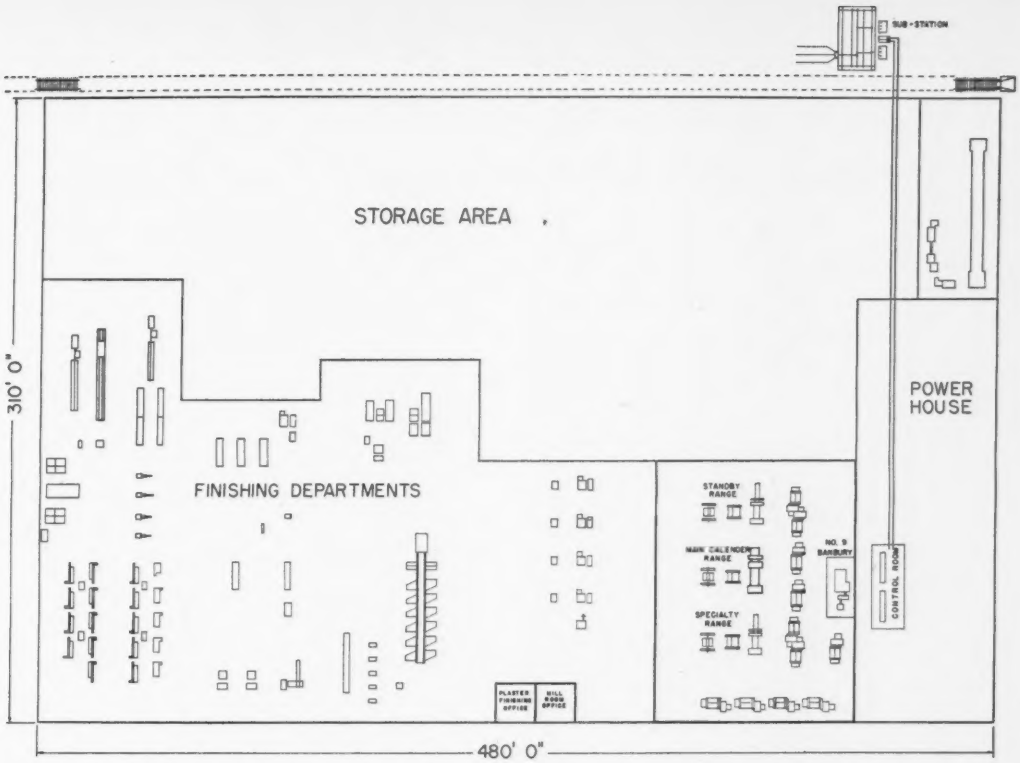



*FIG. 6—Layout of the new Johnson & Johnson adhesive plant (supply voltage above 15 kv).*

plastics plant will depend greatly on the electric utility supply voltage. For purpose of design of the power system we can classify the supply voltage as follows: (a) Below 5 kv (usually 2300 or 4160 volts); (b) 5 kv to 15 kv (usually 13,800 volts), and (c) Above 15 kv.

*Supply Voltage 2300 or 4160 Volts:* With a 2300 or 4160 volt supply the large motors can be applied directly at this voltage. But for smaller motors the lower cost of 440 volt motors and control will frequently justify the cost of unit substation capacity to supply them at 440 volts.

Where is the cross-over point at which it is lower cost to supply the motors at 440 volts? Due to diversity it will be assumed that each kva of transformer capacity will be adequate for about 1.5 hp of connected motor load. This gives a cost for unit substation of about $6.00 per horsepower of connected load. In Fig. 4, this cost has been added to the cost of synchronous motors and control for mills. The results show that for motors below about 200 hp it is less costly to use 440 volt motors supplied by a unit substation.

Of course, these comparisons show the influence of cost for one condition. Need for smaller unit substations or lower diversity factors than assumed for the comparisons will result in extending the point of equal cost to lower horsepower ratings. Also, voltage dip problems on a 440 volt supply from a relatively small unit substation may indicate better application for motors directly at the incoming 2300 or 4160 volts.

To supply large motors at 2300 or 4160 volts and small power and lighting at 460 volts a power system arrangement such as that shown by Fig. 5 can be used.

*Supply Voltage Above 15 kv:* Consideration of a typical plant—the Johnson and Johnson adhesive plaster mill—will illustrate the choice of voltage where a small rubber or plastics plant is supplied at a voltage above 15 kv. The plan of this typical plant is shown in detail in Fig. 6.

This plant is similar to a small rubber plant and has the same type of stock processing machinery for preparation of the rubber type compounds for the adhesive plasters. A calender is used for coating the cloth backing with the adhesive compound. Finishing areas continue the process of cutting the rolls of coated plaster to size and rolling on metal spools. Machines and operations in other finishing areas produce adhesive bandages and similar products.

The Johnson & Johnson plant consists of essentially one basic stock processing unit with certain standby and special purpose equipment. The power house was placed adjacent to the mill room in order to reduce the piping of steam, water, air and refrigerant to a minimum.

The electric utility supply voltage to the plant is 33 kv. The closest suitable location for the substation to reduce the voltage to a level suitable for taking into the plant is 350 feet away from the control center in the power house.

As shown in Table III, the 2300 volt motors and con-

TABLE III—COMPARISON OF COST OF 460 AND 2300 VOLT SYSTEMS FOR JOHNSON AND JOHNSON ADHESIVE PLASTER PLANT

| Item | 460 Volts | 2300 Volts |
|---|---|---|
| Outdoor Substation | About same for either voltage | |
| Motors and Control (75 HP and over) | $56,000 | $66,000 |
| High Voltage Switchgear | | 7,000 |
| Low Voltage Switchgear (Including 6 feeders) | 9,500 | |
| Unit Substation, 500 KVA (Including 6 feeders) | | 8,500 |
| Cable, Substation to Control Room —350 leaded VC in Conduit | 14,700 | 3,500 |
| | $80,200* | $85,000* |

* Cost of circuit breakers in panel boards should be added to obtain complete cost comparisons.

trol were about $10,000 more expensive than 440 volt motors and control. This extra cost is offset somewhat by the higher cost for the 350 feet of 460 cable between substation and control room. The comparison shows an advantage of $4800 in favor of the 460 volt system.

While not included in the estimate, there may be additional costs favoring the 2300 volt arrangement. The available short-circuit current at the main bus with the 460 volt arrangement is approximately 50,000 amperes. For panel boards at the remote parts of the plant, cable impedance is sufficient to reduce the fault current enough to permit the application of circuit breakers with a 15,000 amp interrupting rating. For panel boards near the control room, more costly circuit breakers of 25,000 amperes interrupting rating may be required. And for any panel boards in or directly adjacent to the control room, it might be necessary to use a feeder reactor to decrease the fault current to a 15,000 or 25,000 ampere level permissible for the panel board circuit breakers. The 2300 volt arrangement with the 500 kva unit substation gives an available fault current already limited to about 15,000 amperes.

For the 2300 volt arrangement, motors as small as 75 horsepower have been applied directly on the 2300 volt system although motor and control for these motors are less costly at 440 volts. This choice was necessary in order to avoid excessive voltage dip on the 500 kva unit substation supplying the power and lighting for the finishing areas. For somewhat larger plants, separate unit substations would be used for supplying the finishing areas and larger motors could be operated from a 460 volt unit substation in the stock processing area.

For the larger finishing areas, the lower cost of 2300 volts as a distribution voltage would also be evident. Even for the Johnson & Johnson plant it is believed that 2300 volts is a better choice than the 460 volt main power system in order to provide better flexibility for future expansion.

For the general case of a plant supplied at above 15 kv, an arrangement similar to that previously shown in Fig. 5 would be used with the two incoming lines supplied from an outdoor substation to transform the high voltage to 2300 or 4160 volts.

One rather interesting idea brought out by study of this plant will be mentioned. For the 2000 kva supply (2-1000 kva units in parallel) voltage dip on the 400 hp motor for driving the Banbury mixer is over 7.5 for across the line start and for operation from one of the transformers of 1000 kva about 14%. Since both of these are excessive for the lighting loads, it will be necessary to adopt a wound rotor motor for the Banbury mixer. For the wound rotor motor the motor plus control costs about $4000 more than the corresponding squirrel cage motor and control. The difference between cost of 2-1000 kva and 2-1500 kva unit substations is also about $4000. Thus, it would be possible to buy an additional 1000 kva of transformer capacity for the same price as required for installing a wound rotor motor rather than a squirrel cage motor. The voltage dip with this larger supply is about 6 and 9 percent, respectively.

While even with the larger supply in this particular example voltage dip is still excessive it illustrates that in some cases it may be more economical to increase the size of the power supply rather than adopt a number of more costly wound rotor motors. This additional capacity will give overall better voltage during starting of all motors and will also be available for future expansion.

*Supply Voltage of 5 to 15 kv:* In the case of supply above 15 kv, as has been discussed, the real incentive for adopting 2300 or 4160 volts as utilization voltage for the large motors was to obtain also a suitable plant distribution voltage. Where the plant is supplied at a voltage between 5 and 15 kv this can serve as a plant distribution voltage. Yet the voltage is too high for the size of motors used in the rubber or plastics plant. Thus, all power must be transformed to 440 or 2300 volts for utilization.

For the very small plant somewhat lower cost may be achieved by a single 460 or 2300 volt unit substation. The choice between 2300 volts and 460 volts will be based on the same factors as where the supply voltage is above 15 kv. But there will be more advantage in the 440 volt motors since their lower cost need not be offset by long low voltage cables.

For larger plants it will be less costly and more flexible to adopt the incoming utility supply voltage as the plant distribution voltage. Unit substations in the particular load areas can supply 460 and 2300 volt loads as shown in Fig. 7.

## Conclusions

It is difficult to draw exact conclusions for general use. This is particularly true for the small plants we have considered in this paper. Comparison of first costs can be only one consideration. The ability to easily expand the electrical system in response to load growth and plant extension is an important feature.

*(Continued on page 488)*

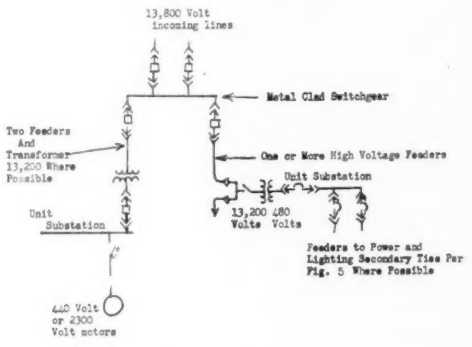



*FIG. 7—Suggested power system arrangement for power supply of 5 to 15 kv.*

# A Call for More Reserves

## Assets of Many Rubber Companies are Considerably Inflated and Require Review to Keep Businesses in Working Condition

By ARTHUR ROBERTS
*31 Passaic Ave., Pompton Lakes, N. J.*

**Readers of this journal will remember Mr. Roberts as the author of the hard-hitting series of articles on "Better Management for the Rubber Factory" published several years ago. Mr. Roberts is an accountant with close associations with the rubber manufacturing industry and is familiar with its basic financial problems. In the current article he discusses over-weight and under-weight reserves, and what to do about them.—Editor.**

FIELD studies indicate that at present there is a lot of excess fat on the assets of many rubber factories and it should be reduced to keep the businesses in good working condition. On the other hand, the reserves shown on the books are too thin to maintain a healthy enterprise. The remedy is to transfer the excess fat from the assets to the under-weight reserves. There are a number of reasons why the net worth on the books of many rubber factories is bloated. These are discussed below.

### Inadequate Depreciation Write-Offs

Charging off depreciation accurately is an important factor in successful operation. Management in the rubber industry can give away thousands of dollars over a period of years if the depreciation charge is short of actual wear, tear and obsolescence, a chronic condition in too many rubber factories. Before the war, equipment and other depreciable assets cost less than they cost today; hence, the potential loss was less.

The rubber manufacturer stands to lose much more today if he does not charge off adequate depreciation because the cost of depreciable assets has gone up considerably. Yet, many in this industry still estimate depreciation on a hit-or-miss basis and never compare actual wear, tear and obsolescence with book values by means of a periodical appraisal.

Many rubber manufacturers use a composite rate on all equipment, but this is poor procedure because the depreciation varies, not only by departments but by items. For example, the average composite life of all machinery used in the manufacture of rubber goods is approximately 17 years, but the average useful life of a mixer or warming mill is 25 years, whereas the mold account generally takes about a 3-year life.

When a rubber manufacturer uses a composite rate to charge off the depreciation on his equipment, and the composite rate "blankets" such wide variances, then obviously there is bound to be a big difference between the book value of depreciable assets and real value. Considering the variance of wear, tear and obsolescence on the many diverse units found in rubber factories, the manufacturer must do a more precise job than that if he expects to maintain maximum cost control and minimize the hazard of loss.

The one safe measurement for appraising the depreciation of a unit is to get the actual rate of wear and tear for the same or a similar unit from the books. The Treasury Department looks favorably on depreciation deductions based upon actual experience figures, yet we have known cases where the books showed equipment to last only 10 years and the management estimated the rate of replacement equipment on the basis of a 15-year lifespan, increasing subsequent tax expense and indirectly decreasing profits because it did not include enough depreciation in its costs, which reduced selling prices by the differential.

Even those managements who watch their costs carefully often overlook a big loss factor in the depreciation write-off. Substantial economies can be effected by handling this write-off in a more business-like manner, starting with an appraisal of the depreciable assets, checking the appraisal against the unrecovered cost on the books (the original cost less the depreciation taken to date), then making the necessary adjustment to bring book value and realistic value into agreement, and basing future rates on the item or group of the same items instead of an average composite life of all machinery used in the plant.

Some business experts contend that the user should be permitted to write off his equipment as he pleases, but not more than 20 per cent yearly, because he is entitled to cash in on his investment within this period of time. This would probably facilitate the problem for both the taxpayer and the Treasury Department, but until such a ruling is legalized, the rubber manufacturer must use his experience figures and a periodical appraisal to keep his depreciation charge-offs in line with reality and his reserves ample to cover wear, tear and obsolescence.

### Bad Debt Losses

Those who use the reserve method of writing off bad debts credit a certain sum each year to a reserve for bad debts and charge the actual bad debt losses to this reserve, not to profit and loss. With bad debts increasing, there is an added hazard to profits and a higher rate should be allowed for in current costs so that customers, in the aggregate, pay for this loss. Where the reserve method is used we find that many such allowances are too low because the percentage of write-off is based upon bad debt losses in the war years when customers had more liquid funds and defaulted less frequently.

A management should average its bad debt losses for the past two years and use this percentage on the current year's credit business as the charge to profit and credit to the reserve for bad debts. Unless this is done, the rubber manufacturer may find, as some have already found, that the charges to this reserve are in excess of the credits, which is, in effect, a reduction of net worth or surplus.

### Over-Valuation of Inventory

In the out-of-the-way places of many stockrooms, the rubber manufacturer is still including in his inventory at original cost many items that should be written down to current value. A write-down of inventory need not be covered by a reserve because the loss is reflected in the inventory figure at the end of the accounting period when the physical count is taken.

There is a way of getting a loss on inventory back from customers but it can't be done after the loss occurs. Allowance, as with bad debts, must be made in advance and credited to a "Reserve for Inventory Losses" account. This allowance is included in production costs. To arrive at the estimated figure, the loss on inventory is averaged over prior years and although it may be included in costs, it is not an income tax deduction because the inventory figure at the end of the year automatically takes care of inventory losses if the count is taken at cost or market, whichever is lower.

### High Taxation

We may as well become reconciled to the fact that high tax expense is not a temporary affliction, it is here to stay as long as wages and prices remain substantially above the general prewar level, as long as government spending continues in the high brackets—and these things are sure to stay a while. This makes pertinent a reference to a "Reserve for Taxes," an account that many rubber manufacturers omit from their books, yet tax expense is as fixed as depreciation expense, hence it requires a reserve just as much as wear and tear if a financial statement is to approximate accuracy.

From the standpoint of working capital, a reserve for taxes is equally desirable. Tax is more a current obligation than bills payable. You may stall off your suppliers for a month or so without penalty but you can't hold up Uncle Sam for his tax dollars. Every business statement should include a figure for the income tax due to date, the credit going to a "Reserve for Taxes," the reserve charged when the payment is made to the Collector. Unless this reserve is set up, the net worth is inflated by the amount of the accrued tax.

### Re-Appraisal of Reserves in Order

In a recent survey, we found that only about 20 per cent of the factories in the rubber industry had adequate reserves, the remainder were crediting their reserves with sums that fell short of the actual shrinkage in their assets because the percentages were calculated years ago and were never changed despite changes in the factors that influence such write-offs.

It is time for a realistic appraisal of your reserves in order to adjust them to values as they really are. If the figures on the reserve accounts are too low the only way to adjust them with reality is to charge net worth or surplus for enough to provide an adequate credit. You can't charge the profits for previous years. You earned less than you thought you did in former years. Many a management has experienced this jolt in prewar years; some of them found themselves with deficits on their hands when they thought they were sound financially. In these higher-cost times, businessmen are likely to suffer greater losses if their books show inadequate reserves or none at all.

If some of your money went down the hole because of faulty accounting in prior years there is nothing you can do to retrieve the loss now but you can see to it that you take enough depreciation on all new equipment or other depreciable assets acquired from now on. But it is poor business to stop at this point.

The figures credited to your reserves are only based on estimates, and you must watch them periodically to make proper adjustments if a fair appraisal indicates that this is necessary. If you've got to hit your surplus or net worth with this adjustment, do so. Water belongs in a boiler, not on a financial statement. Then, too, the reserve is only a book figure. You may have $25,000 in reserves on your books and have only $10 in the bank. The purpose of a reserve is to give your net worth a realistic book value, not to assure the retention of enough cash to buy replacement assets. If you want to freeze your reserve figures in actual cash, you must set aside the actual cash in a sinking fund, but few managements can afford to do this.

Moreover, one can buy equipment on time today and this requires that you have only the down payment, you pay the remainder out of the increased profits earned by the betterment. The rubber manufacturer should forecast his equipment needs far enough in advance to increase his working capital by enough to take care of the down payment without impairing his ability to meet his current obligations to creditors. The planning of an aggressive sales campaign, rigid cost control, a minimum investment in inventory consistent with trade demands, the discounting of bills and prompt collections are helpful in this connection.

Obsolescence is a phase of depreciation. In normal times, it isn't much to worry about but in these hectic times it can be a detriment to profits; hence, the reader should make an allowance for it when it appears likely. The introduction of improved equipment during the past few years, equipment that surpasses the units sold in prewar years and the early postwar years, may compel more than one rubber manufacturer to replace these purchases prematurely before he has written off all the depreciation as originally estimated. Even if one has been charging off enough wear and tear, the high rate of obsolescence may have decreased the value of the equipment in use and the reserves should reflect this extra cost.

Inaccurate reserve accounting deflates overhead, distorts mark-up, and inflates net profit so that monthly analysis of the profit and loss statement is not dependable. Unless ample reserves are shown on the books, prices may be geared too low for reasonable profit. The lack of adequate reserves explains why many businesses that seem to flourish for a time suddenly lose financial strength. Reserves are a "cushion" against invisible losses that run high with the years unless provision is made to cover them with this accounting device. Rubber manufacturers should examine their reserve accounts carefully and line them up with financial reality.

## New Eriez Magnetic Pulleys

Increased magnetic power, lighter weight and greater structural strength are provided in the new magnetic pulleys now being manufactured by the Eriez Manufacturing Co., Erie, Penna. The pulleys are made in sizes to carry 12, 15, 18 and 20-inch belts, with 24- and 30-inch sizes also available. Uniform flux distribution from end to end of the pulley across the full width of the belt is featured. In principle, the new pulley duplicates the engineering of the old. Material to be separated, tramp iron from reclaimed rubber, shot from foundry sand, iron from pulverized coal, etc., flows on a belt over the magnetized pulley. Non-magnetic material flows off the tangent into a bin. Ferrous inclusions stay on the belt until carried under and out away from the magnetic field where they drop into a separate bin.

# Improvement of Dispersion of Benzothiazyl Disulfide in GR-S and Natural Rubber by Use of Fusion Mixtures with Sulfur

By M. C. THRODAHL

*Monsanto Chemical Co., Nitro, West Virginia*

**A series of low-melting fusion mixtures specific for benzothiazyl disulfide and sulfur have been found to improve the dispersion of this accelerator in GR-S and Hevea rubber stocks. Both high-melting, slightly soluble accelerator and sulfur are thus incorporated into the rubber stock in the liquid state. Preparation of fusion mixtures and methods of measuring dispersion are described. Data are shown which demonstrate the dispersing, vulcanizing and aging properties of one of the low-melting fusion mixtures. On an equivalent weight basis with separate components the fusion products are faster in rate of cure, slightly more scorchy, and equal in aging properties. These effects are more pronounced in GR-S than in Hevea rubber.**

BENZOTHIAZYL disulfide has been used extensively as an accelerator of vulcanization of rubber for several years. However, recent advances in compounding practices, particularly shorter mixing periods, have materially intensified the problem of producing uniformly dispersed stocks. The solubility of high-melting benzothiazyl disulfide in rubber is very slight.

As one means of improving the dispersing characteristics of this accelerator in rubber, low-melting fusion mixtures of benzothiazyl disulfide and sulfur have been found which allow both the high melting accelerator (m. p. 172°-175°C.) and sulfur to be incorporated into a rubber stock in the liquid state. The purpose of this paper is to describe the preparation of a series of these fusion mixtures and show physical data on dispersing and vulcanizing characteristics of rubber stocks containing them.

## Preparation and Evaluation of Materials

*Method of Measuring Dispersion*: The dispersing properties of benzothiazyl disulfide in rubber have been extremely difficult to evaluate in the laboratory. Many samples which are difficult to disperse (i.e., leaving small agglomerates throughout the masterbatch) on a plant-sized scale are quite satisfactory when dispersed on a laboratory scale. Observation of mixings in the laboratory Banbury has revealed nothing of significance up to 1800 g. batches. On a laboratory scale there is apparently no correlation between milling time on open rolls and dispersion. Even the qualitative comparisons of rate of incorporation, caking on the back roll, number of sweepings of accelerator which are necessary to incorporate the batch, etc., have been inconclusive.

Note: This paper was presented before the Division of Rubber Chemistry, A.C.S., Atlantic City, N. J., September 26, 1949.

The following method, which is entirely empirical, is based on the observation that the degree of dispersion is directly related to the fineness of the particle in the swollen elastomer, and may be measured by the amount of light transmitted through the elastomer/solvent system. The following technique has been found to differentiate clearly between the dispersing properties of the stocks shown in this paper:

A 25% masterbatch is mixed on a 2-inch x 6-inch open mill. A batch of 20 g. rubber and 5 g. accelerator is used. After the last of the accelerator is in the batch, 6 refinings are made and the stock is sheeted out. Thickness is apparently not critical. Solutions of the masterbatch (0.5, 1.0, 1.5, 2.0%) are then prepared with benzene and placed in stoppered bottles.

The contents are left standing for a period of approximately 16 hours at room temperature. After this period the bottle is shaken until all the rubber masterbatch is in solution (about 5 minutes). A solution containing a well dispersed masterbatch will be clear but a poor one will be definitely cloudy or even show particles which have settled out. In doubtful cases it may be desirable to express results in a quantitative way by determining electrophotometrically the transmission of incident light. (It is desirable to make comparisons as soon as complete solution has taken place because any benzothiazyl disulfide which settled out will, after

TABLE I—INCIDENT LIGHT TRANSMISSION OF BENZENE SOLUTIONS OF MASTERBATCHES OF NATURAL RUBBER AND THE 50/50 BENZOTHIAZYL DISULFIDE/SULFUR FUSION MIXTURE

| | Stock Composition | | | |
|---|---|---|---|---|
| | 1 | 2 | 3 | 4 |
| Smoked Sheets | 20.0 | 20.0 | — | — |
| GR-S | — | — | 20.0 | 20.0 |
| 50/50 Benzothiazyl Disulfide/Sulfur Fusion Mixture | 10.0 | — | 10.0 | — |
| Benzothiazyl Disulfide | — | 5.0 | — | 5.0 |
| Sulfur | — | 5.0 | — | 5.0 |
| Concentration (%) of Masterbatch in Benzene | Percent Incident Light Transmission (Red Filter) | | | |
| 0.5 | 94.5 | 90.8 | 94.9 | 90.8 |
| 1.0 | 82.0 | 77.1 | 88.3 | 85.2 |
| 1.5 | 79.0 | 58.2 | 79.2 | 65.2 |
| 2.0 | 48.0 | 19.0 | 76.9 | 19.6 |

TABLE II—MELTING AND SCORCH CHARACTERISTICS OF SOME BENZOTHIAZYL DISULFIDE-SULFUR FUSION MIXTURES IN GR-S AND NATURAL RUBBER

Base Formulae: 100 GR-S, 40 EPC Black, 3 Zinc Oxide, 8 Softener (Paraflux).
100 Smoked Sheets, 50 EPC Black, 5 Zinc Oxide, 2 Softener (Pine Tar), 3 Stearic Acid.

| | Fusion Mixture Composition | | | | g. Sulfur Added per 100 g. Smoked Sheets [c] | Scorch Time of Stock in Mins. @ 121° C.[d] | | 300% Modulus (psi) of Vulcanizate (30 Min. Cure)[e] | |
|---|---|---|---|---|---|---|---|---|---|
| Stock | % Sulfur | % Benzothiazyl Disulfide | g. Used per 100 g. Elastomers [a] | g. Sulfur Added per 100 g. GR-S [b] | | GR-S | Smoked Sheets | GR-S | Smoked Sheets |
| 1 | 60.7 | 39.3 | 3.053 | 0.150 | 1.150 | 29 | 18 | 375 | 1130 |
| 2 | 57.5 | 42.5 | 2.823 | 0.377 | 1.377 | 24 | 19 | 370 | 1085 |
| 3 | 53.6 | 46.4 | 2.586 | 0.614 | 1.614 | 23 | 17 | 325 | 1175 |
| 4 | 50.0 | 50.0 | 2.400 | 0.800 | 1.800 | 21 | 17 | 425 | 1220 |
| 5 | 49.0 | 51.0 | 2.352 | 0.848 | 1.848 | 14 | 11 | 795 | 1300 |
| 6 | 43.5 | 56.5 | 2.123 | 1.076 | 2.076 | 16 | 12 | 600 | 1090 |
| 7 | 40.0 | 60.0 | 2.000 | 1.200 | 2.200 | 15 | 14 | 560 | 1060 |
| 8 | 36.6 | 63.4 | 1.892 | 1.308 | 2.308 | 16 | 14 | 550 | 1120 |
| 9 | 27.8 | 72.2 | 1.662 | 1.538 | 2.538 | 18 | 14 | 470 | 1060 |
| 10 | 20.0 | 80.0 | 1.500 | 1.700 | 2.700 | 20 | 18 | 240 | 1020 |
| 11 | 16.2 | 83.8 | 1.431 | 1.768 | 2.768 | 24 | 20 | 220 | 855 |
| 12 | (Control) | 100.0 | 1.200 | 2.000 | 3.000 | 30 | 18 | 275 | 1050 |

(a) g. of fusion mixture adjusted to give a benzothiazyl disulfide content of 1.2 g./100 g. elastomer. (b) g. sulfur added to make total concentration equal to 2 g./100 g. GR-S. (c) g. sulfur added to make total concentration equal to 3 g./100 g. smoked sheets. (d) All stocks attained a temperature of 90-95° C. during milling. (e) GR-S stocks were vulcanized at 142° C.; Hevea stocks were vulcanized at 135° C.

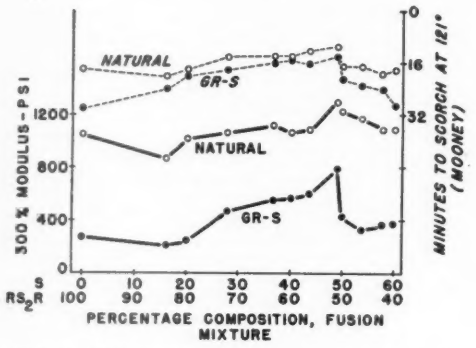



*FIG. 1—Relationship of the composition of fusion mixture, scorch time and modulus.*

a time, dissolve to the extent of about 0.25%. It has been observed that cloudy samples have cleared up after 2 to 3 days standing).

A Fisher Model AC Electrophotometer using a red filter is employed for the measurements. Typical results are shown in Table I.

*Fusion Mixtures*: These products were prepared by heating appropriate amounts of commercial rubber-maker's sulfur and benzothiazyl disulfide in an open vessel equipped with a slow speed agitator. Ingredients were first dry blended and brought slowly to fusion temperature (165°C). Hardening agents (i.e., ammonium hydroxide and the like) were added after complete fusion was effected. After stirring for one minute the melt was quickly discharged into a shallow stainless steel pan at an average depth of approximately 1/16th inch and allowed to cool at room temperature. After complete hardening the fusion mixtures were ground with mortar and pestle to 100 mesh fineness. Large scale batches were ground in a laboratory size Raymond Pulverizer. Fusion mixtures prepared without aid of a hardening agent were sticky masses which could not be ground even after several months standing whereas use of a basic hardening agent enabled grindable products to be prepared in a few minutes.

*Incorporation Into Rubber Stocks And Testing*: Laboratory practices following ASTM Standards Pro-

TABLE III—EFFECT OF $NH_4OH$ CONCENTRATION ON HARDENING CHARACTERISTICS OF 50/50 BENZOTHIAZYL DISULFIDE/SULFUR FUSION MIXTURE (FOUR HOURS AFTER PREPARATION)

| % $NH_4OH$ | Softening Point (°C.) |
|---|---|
| 0.03 | 55 |
| 0.06 | 54 |
| 0.08 | 51 |
| 0.11 | 97 |
| 0.14 | 90 |
| 0.17 | 89 |
| 0.20 | 97 |
| 0.22 | 97 |
| 0.25 | 90 |
| 0.28 | 104 |

TABLE IV—EFFECT OF STOCK-MIXING TEMPERATURE ON SCORCH CHARACTERISTICS OF A NATURAL RUBBER TREAD STOCK CONTAINING A 50/50 BENZOTHIAZYL DISULFIDE/SULFUR FUSION MIXTURE

Base Formula

| | |
|---|---|
| Smoked Sheets | 100.0 |
| EPC Black | 50.0 |
| Zinc Oxide | 5.0 |
| Pine Tar | 2.0 |
| Stearic Acid | 3.0 |

| Stock Composition | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| 50/50 Fusion Mixture | — | — | 2.0 | 3.0 |
| Benzothiazyl Disulfide | 1.0 | 1.5 | — | — |
| Sulfur | 3.0 | 3.0 | 2.0 | 1.5 |
| Mixing Temperature | Mins. to Scorch in Mooney Viscometer @ 121° C. (Large Rotor) | | | |
| 60° C. | 22 | 24 | 23 | 19 |
| 95° C. | 25 | 22 | 17 | 16 |

TABLE V—EFFECT OF MIXING TEMPERATURE ON VULCANIZING AND DISPERSING PROPERTIES OF A 50/50 BENZOTHIAZYL DISULFIDE/SULFUR FUSION MIXTURE IN GR-S

Base Formula: 100 GR-S, 40 EPC Black, 3 Zinc Oxide, 8 Softener (Paraflux)

| Additives | | Stock 1 Mill Mixed | | Stock 2 Mill Mixed | | Stock 3 Banbury Mixed | | Stock 4 Banbury Mixed | |
|---|---|---|---|---|---|---|---|---|---|
| Sulfur | | 2.0 | | 0.5 | | 2.0 | | 0.5 | |
| Benzothiazyl Disulfide | | 1.5 | | — | | 1.5 | | — | |
| 50/50 Fusion Mixture | | — | | 3.0 | | — | | 3.0 | |
| **Mixing Conditions** | | | | | | | | | |
| Stock Temp. (°C.) | | 44 | 93 | 48 | 95 | 79 | 95 | 79 | 92 |
| Roll Temp. (°C.) | | 80 | 125 | 80 | 125 | | | | |
| Mixing Time (Min.) | | 17 | 19 | 15 | 19 | 12 | 12 | 12 | 14 |
| **Physical Properties** | Min. Cure @ 138° C. | | | | | | | | |
| 300% Modulus in lb./sq. in. | 15 | — | — | — | 270 | — | — | — | 120 |
| | 30 | 75 | 80 | 70 | 440 | — | 65 | 115 | 335 |
| | 45 | 170 | 175 | 180 | 475 | 165 | 160 | 200 | 480 |
| | 60 | 305 | 315 | 255 | 590 | 260 | 325 | 350 | 650 |
| Ultimate Tensile Strength in lb./sq. in. | 15 | — | — | — | 595 | — | — | — | 475 |
| | 30 | 315 | 345 | 360 | 1435 | — | 210 | 325 | 595 |
| | 45 | 1195 | 1300 | 1150 | 1975 | 640 | 480 | 880 | 1175 |
| | 60 | 1875 | 1890 | 1675 | 2265 | 965 | 965 | 1455 | 1820 |
| Ultimate Elongation in % | 15 | — | — | — | 750 | — | — | — | 870 |
| | 30 | 975 | 985 | 850 | 770 | — | 800 | 820 | 755 |
| | 45 | 1025 | 975 | 720 | 810 | 850 | 750 | 790 | 900 |
| | 60 | 900 | 920 | 700 | 760 | 790 | 740 | 850 | 820 |

Notes: Stocks 1 and 3 contained very small particles of accelerator visible in a freshly cut cross-section. Stocks 2 and 4 were devoid of visible particles. The fusion mixture melted at the higher temperatures and incorporated with the rest of the stock as a liquid.

cedure D 15-41 for mixing were used with the following modifications: A 6-inch x 12-inch rubber mill and a type 00 Banbury mixer were used for these studies. Base formulas were prepared in a type 00 Banbury. These batches were 10 times the formula weight in grams. Additives were incorporated using a 6-inch x 12-inch mill and batches were 3 times the formula weight in grams. The fusion mixtures were added very rapidly to observe melting and dispersion into the stock. Each batch was cut 6 times and refined end-for-end 10 times. Temperature of each mix was measured with a Cambridge needle pyrometer.

Stress-strain properties were determined in accordance with ASTM Standards Procedure D 412-41. All stress-strain results shown are arithmetic averages of 6 specimens.

Scorch data on compounded stocks were obtained using the Mooney Shearing Disc Viscometer at 121°C.

TABLE VI—VULCANIZING AND AGING CHARACTERISTICS OF A 50/50 BENZOTHIAZYL DISULFIDE/SULFUR FUSION MIXTURE IN NATURAL RUBBER

Base Formula: 100 Smoked Sheets, 50 EPC Black, 5 Zinc Oxide, 2 Pine Tar, 3 Stearic Acid, 1 Antioxidant

| | | | | | Stress-Strain Properties | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Milling Temperature 95° C. | | | | | | | | Milling Temperature 60° C. | | | | | | | |
| | | | | | Unaged | | | | Aged 6 Hr. @ 121° C. @ 80 psi * | | | | Unaged | | | | Aged 6 Hr. @ 121° C. @ 80 psi * | | | |
| Stock | Fusion Mixture | Benzothiazyl Disulfide | Sulfur | Min. Cure @ 135° C. | 300% Modulus—psi. | 500% Modulus—psi. | Ultimate Tensile Strength—psi. | Ultimate Elong.—% | 300% Modulus—psi. | 500% Modulus—psi. | Ultimate Tensile Strength—psi. | Ultimate Elong.—% | 300% Modulus—psi. | 500% Modulus—psi. | Ultimate Tensile Strength—psi. | Ultimate Elong.—% | 300% Modulus—psi. | 500% Modulus—psi. | Ultimate Tensile Strength—psi. | Ultimate Elong.—% |
| 2 | — | 1.5 | 3.0 | 10 | 500 | 1385 | 2335 | 655 | 1125 | 2345 | 3195 | 655 | | | | No Cure | | | | |
| | | | | 20 | 1240 | 2905 | 4275 | 665 | 1695 | 3165 | 3475 | 565 | 730 | 1875 | 3195 | 680 | 1025 | 2215 | 2985 | 645 |
| | | | | 30 | 1500 | 3490 | 4135 | 580 | 2035 | 3440 | 3455 | 505 | 1125 | 2630 | 3965 | 645 | 1360 | 2750 | 3375 | 595 |
| | | | | 40 | 1765 | 3645 | 4275 | 595 | 2205 | — | 3160 | 440 | 1995 | 3955 | 4090 | 525 | 2235 | — | 2880 | 375 |
| | | | | 60 | 1985 | 3985 | 4180 | 725 | 2325 | — | 3180 | 405 | 2070 | 3995 | 4105 | 525 | 2270 | — | 2845 | 385 |
| | | | | 80 | 2120 | 4045 | 4045 | 500 | 2455 | — | 2795 | 370 | 2165 | 4000 | 4075 | 520 | 2305 | — | 2825 | 375 |
| 4 | 3.0 | — | 1.5 | 10 | 775 | 2035 | 3435 | 670 | 1245 | 2675 | 3305 | 640 | | | | No Cure | | | | |
| | | | | 20 | 1365 | 3110 | 4320 | 645 | 1685 | 3250 | 3425 | 545 | 800 | 2070 | 2955 | 625 | 1015 | 2245 | 3165 | 655 |
| | | | | 30 | 1605 | 3645 | 4175 | 570 | 2135 | — | 3320 | 455 | 1215 | 2895 | 4125 | 650 | 1525 | 2965 | 3245 | 565 |
| | | | | 40 | 1905 | 3880 | 4245 | 560 | 2415 | — | 3115 | 420 | 1950 | 4120 | 4340 | 535 | 2195 | — | 2870 | 400 |
| | | | | 60 | 2005 | 4010 | 4030 | 505 | 2450 | — | 2975 | 395 | 2145 | 4015 | 4325 | 555 | 2285 | — | 2550 | 335 |
| | | | | 80 | 2210 | 4120 | 4120 | 500 | 2500 | — | 2875 | 355 | 2025 | 4000 | 4025 | 510 | 2240 | — | 2615 | 350 |

* Air Bomb ASTM D 454-41.

## Discussion of Results

The original fusion mixtures of benzothiazyl disulfide and sulfur were prepared without the aid of a hardening agent. These consisted of the following compositions: 1 gram-mol of benzothiazyl disulfide with 16, 14, 12, 10.4, 10, 8, 6, 4, 2 gram-atoms of sulfur corresponding to benzothiazyl disulfide/sulfur ratios of 39.3/60.7, 42.5/57.5, 46.4/53.6, 50.0/50.0, 51.0/49.0, 56.5/43.5, 63.4/36.6, 72.2/27.8, and 83.8/16.2 respectively. These products were sticky masses. Vulcanizing data obtained with the same fusion mixtures treated with ammonia as the hardening agent are shown in Table II and Figure 1. These data indicate that the 50/50 ratio yielded a product which was of most practical importance from the viewpoint of handling characteristics, since increased ratios of benzothiazyl disulfide resulted in extremely sticky, semi-fluid products which were difficult to weigh out and transfer to the stock.

The effect of various bases on the relative hardening characteristics of a 50/50 fusion mixture was not found to be critical. Although grindable products were obtained with potassium and sodium hydroxides, at least 24 hours were required for hardening. Ammonium hydroxide, however, hardened the fusion mixture almost before the discharged melt had time to settle out into the cooling pan. Hydroxides, such as magnesium, calcium, and aluminum, were also effective as hardening agents. In view of the effectiveness of ammonium hydroxide, some strong organic bases were investigated. Among these, cyclohexylamine and piperidine were very effective.

The melting points and rates of cure of fusion products hardened with various bases were the same within limits of experimental error. Table III demonstrates the effect of concentration of ammonium hydroxide as a hardening agent on a 50/50 fusion mixture. The melting points shown were taken approximately 4 hours after cooling of the melt. Only the products made with 0.1% (or greater) ammonium hydroxide were grindable. It was also found that no hardening was effected by ammonium hydroxide when the ratio of benzothiazyl disulfide exceeded that of sulfur.

The relationships between composition and scorch are shown for GR-S and Hevea stocks in Table II and Figure 1. Here a definite critical region exists as shown in the relationship between melting point and scorch and modulus characteristics of the 50/50 and 51/49 fusion mixtures. While the fusion mixtures containing sulfur in greater ratio melted in the range of 90-100°C., the 51/49 benzothiazyl disulfide/sulfur products and the other ratios in which the benzothiazyl disulfide was the greater were sticky masses and could not be hardened with basic compounds like ammonium hydroxide. The 50/50 fusion mixture yielded best all-round properties of this group of benzothiazyl disulfide/sulfur ratios.

Scorching properties of the 50/50 fusion mixture in a Hevea tread stock shown in Table IV indicate that it is slightly more active than the equivalent amounts of the separate components at the higher mixing temperatures.

The effect of mixing temperature upon the dispersing and vulcanizing properties of the GR-S stocks containing the 50/50 benzothiazyl disulfide/sulfur fusion mixture is shown in Table V. These data demonstrate the effectiveness of mixing at a temperature sufficient to liquefy the fusion mixture in both Banbury and open mill. Table VI, containing comparisons of the 50/50 fusion mixture with equivalent amounts of the separate components in a Hevea tread stock, shows the same relative effect as in the GR-S but to a lesser extent. However, the dispersion of the fusion mixtures was complete in stocks of both rubbers because all of them were incorporated in the liquid state at the higher milling temperatures while visible particles were observed in the control stocks.

TABLE VII—EFFECT OF CARBON BLACK ON VULCANIZING PROPERTIES OF GR-S X-432 TREAD STOCK

Base Formula: GR-S X-432, 100.0; Zinc Oxide, 4.0; Stearic Acid, 1.0; Paraflux, 5.0

| | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Benzothiazyl Disulfide | 1.2 | — | 1.2 | — |
| Sulfur | 2.0 | 0.8 | 2.0 | 0.8 |
| 50/50 Fusion Mixture | — | 2.4 | — | 2.4 |
| Philblack O (HAF) | — | — | 50.0 | 50.0 |
| Kosmobile 77 (EPC) | 50.0 | 50.0 | — | — |
| Min. Cure @ 144° C.* | 300% Modulus—lb./sq. in. | | | |
| 15 | — | 120 | 110 | 175 |
| 30 | 30 | 165 | 135 | 290 |
| 45 | 130 | 275 | 315 | 475 |
| 60 | 140 | 325 | 685 | 825 |
| 75 | 310 | 500 | 790 | 955 |
| 90 | 410 | 600 | 1265 | 1325 |
| 120 | 695 | 895 | 1735 | 1875 |
| | 500% Modulus—lb./sq. in. | | | |
| 15 | — | 180 | 195 | 485 |
| 30 | 80 | 345 | 285 | 645 |
| 45 | 345 | 645 | 815 | 1170 |
| 60 | 410 | 785 | 1710 | 1945 |
| 75 | 830 | 1185 | 2610 | 2170 |
| 90 | 1020 | 1410 | 1850 | 2825 |
| 120 | 1800 | 2130 | — | 3460 |
| | 700% Modulus—lb./sq. in. | | | |
| 15 | — | 265 | 255 | 695 |
| 30 | 110 | 535 | 395 | 890 |
| 45 | 595 | 1195 | 1215 | 1870 |
| 60 | 750 | 1470 | — | — |
| 75 | 1500 | 2435 | — | — |
| 90 | 1915 | 2480 | — | — |
| 120 | — | — | — | — |
| | Ultimate Tensile Strength—lb./sq. in. | | | |
| 15 | — | 325 | 285 | 800 |
| 30 | 190 | 735 | 445 | 995 |
| 45 | 1190 | 2000 | 1335 | 2020 |
| 60 | 1650 | 2270 | 2560 | 2695 |
| 75 | 2220 | 2705 | 2855 | 2860 |
| 90 | 2585 | 2925 | 2405 | 3215 |
| 120 | 3130 | 3440 | 2360 | 3485 |
| | Ultimate Elongation—% | | | |
| 15 | — | 1200+ | 975 | 1020 |
| 30 | 1200+ | 1065 | 935 | 965 |
| 45 | 1100 | 940 | 805 | 810 |
| 60 | 1040 | 915 | 685 | 680 |
| 75 | 865 | 800 | 675 | 675 |
| 90 | 820 | 795 | 550 | 595 |
| 120 | 690 | 685 | 385 | 510 |

* No cures were obtained at 121° C. in 30 minutes.

In Table VII the rate of cure of low temperature GR-S (X-432) with two types of carbon black, HAF and EPC, is shown for the fusion mixture and separate components. Modulus values parallel each other for either stock although the fusion mixture is considerably faster. The drop-off in tensile strength of the HAF black stock cured with separate components was not evident with the fusion mixture. All stocks were mixed at 95°C., stock temperature.

Attempts have been made to learn if these fusion products are merely low-melting physical mixtures, or if a new compound has been formed in the fusion process. Thus far nothing definite can be reported. Continued heating of the 50/50 fusion product at 180°C. in an atmosphere of nitrogen for 4 hours altered curing proper-

ties sufficiently to reduce its curing effectiveness to less than that of the separate components.

The 50/50 fusion mixture has been found to be stable at ordinary shelf storage temperatures for periods of at least 2 years with no evidence of change in properties. Bottle storage under these conditions shows the product to remain free flowing.

## Summary

A series of low-melting fusion mixtures of benzothiazyl disulfide and sulfur has been prepared. Grindable, free-flowing material may be obtained by treating the melt with a small amount of a base, preferably ammonium hydroxide. Storage stability is excellent for periods of at least two years.

Data on dispersion, vulcanizing, and aging characteristics of a 50/50 fusion mixture indicate that (a) it incorporates into the GR-S or Hevea stock in the liquid state, (b) it is slightly more scorchy and faster curing than equivalent amounts of separate components but that such a stock processes within safe limits of temperature, and (c) it has aging properties equal to that of equivalent amounts of separate components. The effects described are more pronounced with GR-S than with Hevea rubber.

The 50/50 fusion mixture of benzothiazyl disulfide and sulfur has been found to be the most effective means of improving the dispersion of this accelerator in rubber.

ACKNOWLEDGMENT

The author wishes to thank the Monsanto Chemical Company for permission to publish this work. The work of M. W. Harman in the preparation of some of the original fusion mixtures, that of R. B. Hill for much of the experimental work on hardening effects, and the helpful criticisms of D. J. Beaver and R. O. Zerbe in preparation of the manuscript are hereby acknowledged.

# New Process Prints Full Color Pictures on Rubber Surfaces

A NEW PROCESS for high-fidelity color printing on rubber surfaces, which has opened a new field for novelty and specialty advertising and which promises to revolutionize certain aspects of the motion picture and television industry, has been developed. The new full color illustrations give a third dimensional effect. The detail and color is best described as comparable to high grade magazine color work. The process itself is a permanent printing on rubber. It is not a decal and can be safely washed whenever cleaning is necessary.

## Companies Licensed to Use Process

The process was invented by two men from San Diego, Calif., Alfred J. Iller, department store owner, and A. L. Smith, former president of the Los Angeles Advertising Club and for many years advertising manager of Barker Brothers in Los Angeles. According to Mr. Smith, an accidental discovery provided the key to the process, complete details of which are not yet available. The Iller-Smith Process, as it is termed, has been licensed to the Lee-Tex Rubber Products Corp. of California for use on balloons and molded rubber articles, and a sub-license has been issued to the Rubbertone Corporation, a division of the Wolfer Printing Co. of Los Angeles, for use on flat rubber goods.

According to reports from the Pacific Coast, Lee-Tex Rubber Products, one of the larger manufacturers of toy balloons, is installing several printing machines capable of turning out 6,000,000 impressions a year each, while the Rubbertone Corporation is installing presses for printing books and sheet rubber stock items. Although technical details are lacking, it is known that the color is impregnated into the rubber in such manner that there is no loss of detail when the rubber is stretched. The process is further described as the first to allow full-color photography reproduction on rubber.

Officials of the Rubbertone Corporation state that the Iller-Smith Process has three basic ideas to offer: (1) To create eye appeal to already established articles, such as tablecloths, bibs, hot water bottles, bathing caps, rubber sheeting, etc.; (2) To create new items with four color process illustrations, such as place mats, coasters, rubber picture books for children, and the like, and (3) to present a new medium for attention getters in advertising mailers and pennants, store counter advertising mats, maps, and so forth, all taking advantage of the fact that color photographs on rubber are entirely new and different.

Already in full production are children's drums with a color photograph of Hopalong Cassidy on each side. According to the manufacturers, never before has there been a drum available with durable rubber drum heads with a cherished color photograph of a cowboy hero. Since the drum retails at only 59 cents, the implication can be drawn that application of the full color process to rubber is not necessarily prohibitive in cost. Although Lee-Tex Rubber Products is carefully guarding its merchandising plans on the new process, it is assumed that it will shortly introduce a completely new line of balloons and inflated characters along with other items, such as playballs. One of the most fascinating new products made possible by the process is the rubber printing book mentioned above. The developers of the process indicate that books of this type can be safely used in the bathtub without losing any of their detail.

## Possibilities in Motion Picture Field

For the motion picture field the Iller-Smith Process opens up a number of new possibilities. From a publicity angle, photographs of stars and scenes from pictures can be used for promotion work and are bound to secure trade attention. A possibility exists for making sections of scenery and backdrops which can be stretched to fit, rolled up, stored, and easily cleaned, all at a great saving in cost. Giveaway premium items can be tied in with movie films at nominal cost to producers and exhibitors. Lobby and marquee promotional and display material can be used over and over by chain theater groups. And finally, the process lends itself to animated shorts, the use of rubber affording an entirely new approach to art work and animation.

# *Editorials. . .*

## Confused Situation

THE ONE WORD which best describes the current rubber situation is—confusion. There are conflicting reports on almost every phase of the industry—producing and consuming included—and the rumor mongers are having a field day. The Korean situation has added considerable fuel to the fire with the result that there is a mad scramble on the Commodity Exchange to place orders for future delivery. Because of the tight situation in actuals of natural rubber July delivery hit a new high for the past twenty-two years in recent days at 35.50 cents a pound. It is indeed fortunate that a maximum gain of two cents a day is covered in Exchange regulations or natural rubber could easily turn into a runaway market.

The current situation is fraught with danger, the supply and demand factor being enmeshed with an uncertain world situation. In this country, the demand is reflected in the field of tires and tubes where current production rates are continuing to confound the experts. All seasonal trends have been reversed this year, to the point where several of the tire manufacturers have eliminated their usual two-week shut-down periods for vacations, maintenance and overhaul.

The tire boom is reflected in the employment records. According to a special report recently issued by the Labor Department, hours worked per week in the tire industry in April averaged 39, as against an average of 37.3 last December. The total number employed in April amounted to 84,000, or 2.3% above the total employed last December. Since a large segment of the industry has a normal work-week of 36 hours, the current work schedules indicate a substantial amount of overtime. Although these figures cover the April period only, there is sufficient evidence on hand to indicate that the trend upward has since continued.

Statistics compiled by the Secretariat of the Rubber Study Group are indicative of the high rate of world consumption. The same statistics, however, also indicate that world production is not only keeping pace with the record consumption but is actually exceeding it. In the first five months of 1949, for example, world consumption amounted to 612,500 long tons whereas world production totaled only 585,000 tons. In the first five months of the current year, however, world consumption amounted to 657,500 long tons and production to 662,500 tons, or an excess of 5,000 tons. It might be assumed that the differential could easily be found in the stock situation were it not for the fact that total stocks at the end of May, 1950, including those in producing and consuming areas and afloat, amounted to 717,500 long tons, as against 700,000 tons at the end of May, 1949.

The figures for May also belie the tight situation which is said to be the crux of the present upward trend in natural rubber prices. World consumption in May, according to the Secretariat, amounted to 140,000 long tons as against production of 150,000 tons, both figures reflecting gains of approximately 10,000 tons over the April figures. Production and consumption in May, 1949, were both estimated at 115,000 long tons. The principal cause of the jump in world consumption in May was high Russian imports of 10,750 tons during the month. Russia imported only 11,000 long tons in the first four months of the year. Russian imports are considered as consumption for statistical purpose, since no actual figures can be secured.

The decision of the RFC to reactivate the GR-S plant at Port Neches, Texas, briefly reported elsewhere in this issue, should have a beneficial effect on the situation. Although natural rubber producers will nail this move as one aimed solely as a deterrent to the further rise of natural rubber prices, it cannot reasonably be regarded solely for such purpose, although it unquestionably will have such an effect, unless further trouble breaks out in the Far East. Only with such a move can we learn how quickly a GR-S plant can be reactivated and be put into full operation. Estimates for reactivation time range from three months to a year. If it should take even three months to reach a major production stage perhaps we had better review our "rubber insurance policy." Three months seems like a long period of time in this atomic age.

# CURRENT NEWS OF THE MONTH

## PRESIDENT TRUMAN SIGNS RUBBER ACT EXTENDING CONTROLS FOR TWO YEARS

A BILL extending the Rubber Act of 1948 for a two year period, or until June 30, 1952, was signed by President Truman on June 24. Under the new legislation the Government continues its ownership and control of the nation's synthetic rubber industry. The law continues the mandatory consumption of 220,000 tons of synthetic rubber a year, of which 200,000 long tons must be general purpose synthetic rubber and at least 20,000 special purpose synthetic of which 15,000 tons must be suitable for use in inner tubes. The Government is also required to maintain stand-by facilities for the annual production of at least 660,000 tons of synthetic rubber a year, of which not less than 600,000 tons would comprise general purpose synthetics. The bill which Congress presented for the President's signature rejected his recommendation of last January that the Executive Branch be given a freer hand in administering the synthetic rubber facilities. The law as passed bars the Government from disposing of any of its synthetic rubber plants until Congressional approval has been obtained. Mr. Truman had asked for a new ten-year law that would have given the Government authority to dispose of at least part of the synthetic rubber industry to private ownership under terms requiring adequate production for defense needs.

Chronologically, the bill signed by the President went through the following phases: After an extensive series of public hearings, the House of Representatives passed a bill (HR-7579) on May 19 extending the Rubber Act for a three year period. On June 5th and 6th a sub-committee of the Senate Armed Services Committee held public hearings and on June 8 the full committee approved the House version but limited the law to a two rather than a three year extension. The Senate approved this legislation on June 17, there being no opposition of any kind on the floor. On June 19 the House decided to go along with the Senate's version of a two year bill and the bill was forwarded to the President for his signature.

### *Industry Presents Viewpoints*

At the hearings held by the sub-committee of the Senate Armed Services Committee, headed by Senator Lyndon B. Johnson (Dem., Texas), the Government's viewpoint on pending legislation was presented by Thomas C. Blaisdell, Assistant Secretary of Commerce. Mr. Blaisdell's testimony supported the Administration's original plan for disposing of the synthetic rubber plants to private industry. This viewpoint was also supported by a majority of the rubber manufacturers who testified at the hearings, with the exception of P. W. Litchfield, board chairman of the Goodyear Tire & Rubber Co. All of the spokesmen for the rubber industry, however, urged a two year extension of the rubber law rather than the three year extension originally proposed in the House.

Several of the industry witnesses urged adoption of the Bricker Bill (S-3294), reference to which has been made in previous issues. Harvey S. Firestone, board chairman of the Firestone Tire & Rubber Co., was among those urging approval of this bill which called for Federal ownership of the synthetic plants but placed their operation in the hands of industry subject to loose controls. The Bricker Bill would have directed a reduction in the mandatory use of synthetic rubber and provided for the leasing of rubber producing facilities at reasonable terms.

Mr. Firestone pointed out that for adequate security it is imperative that the United States have a synthetic rubber which could be used successfully in making the large size tires which are required by the Armed Forces in wartime. He added that it was significant that after eight years of government direction we did not have such a rubber and expressed the belief that if the synthetic rubber plants were leased to industry, research in this direction would be greatly stimulated. Mr. Firestone also stated that industry would be impelled to accelerate synthetic rubber production, research and development in the climate of competitive free enterprise.

In his testimony, John L. Collyer, president of the B. F. Goodrich Co., expressed a strong conviction that national security in rubber is and always will be dependent primarily on the know-how developed by private industry. He declared that "any Government action which does not encourage research and investigation in rubber by private industry will inevitably weaken rather than strengthen the national security." Mr. Collyer also emphasized the point that if the law was extended without major revision Congress should make it clear to those responsible for operation of the synthetic rubber program that it is the Government's responsibility to provide ample synthetic rubber both in peacetime and wartime.

The viewpoint of the General Tire & Rubber Co. was expressed by Charles F. Burke, assistant to the president. Mr. Burke called for Congress to activate the private enterprise policy expressed in the Rubber Act of 1948 but never put to use. He stated that General Tire favors a plan whereby research and development in synthetic rubber conducted by industry could function without Government controls and added that it is not too much to expect that from such a system an American-made rubber better than anything presently known in either crude or synthetic would be forthcoming.

As indicated above, the major dissenter from the viewpoint expressed by executives of the rubber industry was Mr. Litchfield. Although calling for an extension of the rubber legislation for a two year rather than a three year period, Mr. Litchfield was emphatic in his declaration that lease of the synthetic rubber plants to private industry at this time would create too much confusion. He said that he was persuaded to this viewpoint by several reasons, the most compelling of which was the fact that, in his opinion, our national security would be placed in danger by such a move in these critical times.

Mr. Litchfield noted that the currently short supply of synthetic rubber is seriously inconsistent with other vast moves the United States is considering to protect the country in case of aggression. He stated that the matter of national security is of utmost importance and cannot be overemphasized.

Sooner or later, he said the emergency conditions will improve. When that time comes, the country can move toward a permanent national rubber policy including private ownership and operation of the synthetic plants. It was his recommendation, therefore, that Congress continue its existing program of ownership and control of these facilities for two years, meanwhile increasing the stockpiles of synthetic rubber.

R. C. Jopling, vice-president of the Phillips Petroleum Co., in his statment before the Senate group, said that his company did not believe with those who maintain

the Government must continue in the rubber manufacturing business in order to protect the national defense. He said the best safeguard against the recurrence of a rubber stortage is to build, as rapidly as possible, a private competitive synthetic rubber industry.

Mr. Jopling in explaining Phillips' connection with the synthetic rubber industry said that his company would like to buy or lease both the butadiene and copolymer plants at Borger, Texas, and integrate them with Phillips' petroleum facilities. This would make it possible to convert petroleum raw materials into finished rubber and to sell this rubber in a free competitive market.

In concluding his testimony, Mr. Jopling recommended that if the Rubber Act of 1948 was to be extended, Congress eliminate the restrictions in the law which prohibit lessees of Government plants from selling rubber to the Government or others for mandatory use; that steps be taken toward the establishment of a free competitive synthetic rubber industry in accordance with the declared policy in the law; that mandatory production and use of synthetic rubber be increased to a minimum of 400,000 tons per year for the next three years by placing additional stand-by plants in operation, and that the program of stockpiling natural rubber be accelerated to build up a stockpile of a minimum of 1,000,000 tons as quickly as possible.

O. V. Tracy, manager of the Chemical Products Department of the Esso Standard Oil Co., recommended that the Senate body consider the disposal of the government-owned butyl plants as separate and apart from legislation in connection with the general purpose synthetic rubber program. He said that it was the opinion of Esso Standard Oil that the precedent established by the disposal of the neoprene plant (which was sold to DuPont last year) should be followed in disposing of the butyl plants as promptly as possible. He added that butyl rubber has reached a state of development where production and consumption in adequate quantities is assured and will continue without Government support.

Pointing out that the Standard Oil interests had spent approximately $11,000,000 for research and development on butyl rubber, Mr. Tracy emphasized the fact that no effort is now being made to develop additional uses and wider markets that would give assurance of stable production. Despite the fact that the national security minimum for butyl rubber is 15,000 long tons a year whereas current consumption is now at the rate of 52,000 tons, he said that some effort should be made to expand present uses and permit new ones. He added that the sooner the butyl plants are turned over to private industry, the sooner an efficient sales program can be launched and the sooner butyl can make its greatest contribution to the solution of our national problem. In this direction he pointed out that the larger the market butyl reaches, the more natural rubber will be available for stockpiling now and the less our dependence on it in time of emergency.

Other witnesses appearing at the hearings included George M. Tisdale, vice-president of the U. S. Rubber Co., A. L. Freedlander, president of the Dayton Rubber Co. and the Copolymer Corp., J. H. Nesbit, president of the U. S. Rubber Reclaiming Co., and J. W. Crosby, president of the Thiokol Corp. Both Mr. Tisdale and Mr. Freedlander urged passage of the Bricker Bill, while Mr. Nesbit asked that some consideration be given to the rubber reclaiming industry so that it would not be caught between the fixed price of GR-S and the fluctuating price of natural rubber.

Another point of view for consideration by the Senate body was presented by Mr. Crosby in his testimony. While calling for a two year extension of the rubber legislation rather than a three year term, Mr. Crosby decried the tendency to keep operation of the copolymer plants in the hands of the larger rubber companies. He asked that smaller firms be given an opportunity to more actively participate in the synthetic rubber program so that they, too, would get the "feel" of problems involved in the manufacture of the synthetic rubbers.

According to Mr. Crosby, disposal of the copolymer plants at the present time and under existing conditions would promote vertical integration and create undue economic concentration of the synthetic rubber industry, would discriminate against small business by excluding it from the general purpose synthetic industry, would afford hundreds of fabricators of synthetic rubber no alternative but to purchase their requirements from competitors, and would determine the future pattern of the synthetic rubber industry so as to make it impossible for a small company to participate in the manufacture of GR-S even though it has the necessary qualifications.

Mr. Crosby added that prior to disposal, qualified small business should be encouraged to participate in the actual operation of the synthetic plants. Such action, he said, would strengthen the national security, promote research, and provide an element of competition which would work to the best interests of the industry.

### *Greater Competition Urged*

A summation of the hearings was issued by the sub-committee of the Senate Armed Services Committee on June 14. Consisting of a seven-page statement, dictated by Senator Johnson, the report termed the synthetic rubber field "an industry of giants" and said that few small businesses have had an opportunity to acquire adequate know-how, experience and personnel "for survival when private enterprise replaces public ownership." It added that the Government must encourage more small business to enter the field and should push competition in the industry "insofar as it is practicable at present."

Noting that the synthetic rubber industry must eventually stand on its own feet, the report indicated that to do so successfully and beneficially the industry should be permeated with a spirit of keen competition and warned that unless Government encouragement is forthcoming, the Government may well be charged "with the responsibility of permitting monopoly and shutting the door to small business."

It went into considerable length as to the numerous reasons why the Government should continue complete control of the synthetic plants for another two years instead of selling or leasing them at present. The two year extension was considered best "to keep our rubber policy flexible and subject to early change" because "in two years the international situation should be nearer a change."

The report also called for a continuing study of national rubber problems by appropriate Congressional committees. This will afford a necessary opportunity to work with industry and with Government agencies in formulating a satisfactory policy for providing maximum security for the duration of the present "cold war" peril.

In a statement issued on June 18, the Senate Banking and Currency Committee called upon the administration to start loosening up its controls on synthetic rubber. In a report filed with the Senate, the committee said that it wanted a "substantially reduced" required usage of synthetics by the tire industry. It also asked that the industry be free to use more of the rubber voluntarily, and called for the release of one or more of the synthetic rubber plants to private industry.

The unexpected report from the Banking Committee, which was signed by nine of its thirteen members, including Senator Bricker, approved extension of the Rubber Act of 1948 but called for putting its leasing provisions into immediate effect, pointing out that leasing of the plants would result in a better synthetic for the rubber industry, for the users of rubber products, and for the national security of the country. The statement added that "it is inconceivable that with the world situation with respect to natural rubber supply in danger of complete deterioration we should allow research and development in the synthetic rubber field to remain in its present state." According to the statement, short term leases would provide an excellent and perhaps the only satisfactory method for evaluating the Government-owned facilities with a view toward ultimate disposal.

One reason advanced for the statement issued by the Banking Committee was an effort to clear up a legal puzzle on leasing authority which has been vexing Government officials involved in the synthetic rubber program. According to the Rubber Act of 1948, the President is authorized to lease synthetic rubber facilities to private industry with Congressional approval. However, the same law states that "any synthetic rubber or component material as may be produced by the leased facilities shall not be used to satisfy mandatory requirements established by Section 3."

RFC attorneys have expressed the opinion that this phraseology was intended to cover the full 220,000 long tons of mandatory use. The Banking Committee, however, which wrote the rubber legislation two years ago, stated that it meant the restriction to stand only for the rubber the Administration, by frequently revised legislation, feels it must require industry to use to assure consumption of at least 220,000 long tons per year.

## SYNTHETIC PRODUCTION INCREASES SLATED TO CURB NATURAL PRICES

Informed sources in Washington, D. C., announced on July 2, that the Government will reopen one of its standby GR-S plants within a matter of weeks. The move, spearheaded by General Services Administrator Jesse Larsen, will be ordered in the near future by the President. Robert Turner, rubber consultant to John Steelman, assistant to the president, has returned to Washington from his post at the University of Indiana to put the decision into effect.

Precisely which plant and what tonnage will be reactivated are to be determined within the next few weeks, it was said. At least 5,000 tons of GR-S will be added to the 35,000 tons scheduled by the Office of Rubber Reserve for July, boosting production to a 40,000 ton a month minimum for the balance of the year.

Reactivation of another GR-S plant has long been pressed by two rubber industry leaders, John L. Collyer, chairman of the board and president of the B. F. Goodrich Co., and Paul W. Litchfield, chairman of the Goodyear Tire & Rubber Co. Both have also asked for a synthetic rubber stockpile of 200,000 tons.

Mr. Litchfield had previously stated that if the Government had maintained a synthetic stockpile of 200,000 tons, the price of natural rubber would never have risen to its recent high levels. Mr. Collyer maintained that with this supply on hand, no development in the Far East would cause America's economic system to stall for want of rubber.

Mr. Larsen is one of the very few public officials who have gone on record urging reopening of a government synthetic rubber plant to keep the price of natural rubber down. In a letter recently written to Harley Hise, RFC chairman, Mr. Larsen declared that it was the Government's responsibility "to use its synthetic rubber productive capacity to force the adjustment of the price of crude rubber in order that the stockpile (of crude rubber) might be completed at a reasonable cost." The Administration has frowned on suggestions for substantially increasing the stockpile of natural rubber as a drain on limited funds available for such purpose.

### *Production Speeding Methods*

The Reconstruction Finance Corporation has several devices for stepping up the production of synthetic rubber, though most of the $700,000,000 industry has been laid up in standby condition. To reopen enough of the closed plants for any substantial increase in output at this time would cost between $200,000 and $300,000 dollars, the agency said. It is, moreover, a "high policy" decision which RFC cannot make.

Instead, the Office of Rubber Reserve, operating agency for the RFC, is presently sanctioning extensive tests on polybutadiene rubber, a general purpose synthetic containing no critically short styrene. ORR made 720 pounds of polybutadiene, developed by the Phillips Petroleum Co., in June, to be put into tires for road tests. Lack of styrene because of a critical shortage of benzol has handicapped Government's efforts to meet the rising demand for synthetic rubber.

Phillips supplied what is said to be the missing link in the formulation of polybutadiene rubber by finding the proper density rating (25 on the Mooney Scale) at which carbon black could be introduced so that the slurry would be stiff enough to put over dryers. The mixture is put over dryers at 81 or 82° F., making polybutadiene rubber somewhere between "hot" and "cold" synthetic rubbers.

Another step being taken by the RFC is to reduce the styrene content of GR-S presently being produced. The styrene content is being reduced from 30 to 25%. It is to be remembered that when butadiene became short towards the end of World War II, the Government increased the styrene content from 25 to 30% to cut back on butadiene.

RFC is also financing a transatlantic search for benzol, and is considering a slight but important change in the temperature at which the synthetic plants operate. By boosting the temperature at which synthetic is made, that is from 117° F. to 123° F., experts maintain that production will be boosted over the rated capacity of the plants. Finally, fewer types of synthetics will be made.

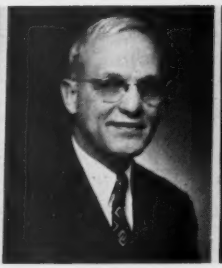
Government experts say that GR-S has been produced in dozens of slightly varying varieties to meet the rubber companies' individual specifications. This courtesy to customers cuts down on output, however. Each variation requires stopping machinery, cleaning out some lines, then starting up again. As the rubber plants near their top load, fewer types will be made to eliminate these time losses. The rubber companies will have to alter their formulations and processes somewhat, but the Government maintains they can do this without too much trouble.

---

Goodrich Chemical has developed a new rabbit repellent for gardeners that is said to greatly reduce the amount of damage to agricultural crops, flowers and vegetables. The new material is called "No-Nib'l."

## U.S. RUBBER ANNOUNCES PROMOTIONS OF WHITE, NORTON AND NOONAN

E. H. White



W. H. Norton

C. J. Noonan

Elmer H. White, formerly vice-president and general manager of the Footwear and General Products Division of the U. S. Rubber Co., has been promoted to a new post in which he will serve as an adviser to the president, the executive committee and the general managers on sales, sales promotion, advertising and distribution. Walter H. Norton, assistant general manager of the Footwear and General Products Division, has been elected vice-president and general manager to succeed Mr. White. Mr. Norton has been succeeded as assistant general manager of the division by Chester J. Noonan, formerly general sales manager.

Mr. White began his career with U. S. Rubber as a stock boy 47 years ago. Later he became a salesman and then a branch sales manager of the Footwear Division. In 1925, he became footwear sales manager of the Pacific Coast Division. He became general sales manager of the division in 1938 and assistant general manager in 1939. He was promoted to general manager of the division in 1944 and vice-president of the company in 1945.

Mr. Norton has been associated with the company for 39 years, starting as a stock clerk. In 1915, he was offered a position in the Cost Department of the company's Naugatuck, Conn., footwear plant. He became assistant superintendent of the plant in 1915 and production superintendent in 1919. Mr. Norton was appointed factory manager of the Williamsport, Penna., plant in 1921 and of the Naugatuck plant in 1928. In 1941, he became production manager of the Footwear Division and in 1943, assistant general manager.

Mr. Noonan started his career with the company 31 years ago as a clerk in the Footwear and Clothing Department at Great Falls, Mont. One year later he became a salesman in Butte. He was appointed footwear sales manager in Salt Lake City in 1922, and in Los Angeles in 1929. He became regional sales manager in 1931, and Pacific Coast divisional sales manager for the Footwear Department in 1933. He was made manager of clothing and coated fabric sales for the Footwear Division in 1938, and general sales manager of the division in 1943.

## STATE DEPARTMENT CITES DANGERS IN NATURAL RUBBER PRICE RISES

In an attempt to curb the gyrating prices of natural rubber, the U. S. Department of State, on June 9, spoke out sharply to the rubber producing countries against "speculative" price rises. The State Department called attention to the "serious implications" of the price movements, and advised both producing and marketing countries that "wide speculative swings in the price of a major raw material perform a disservice to the producer and consumer alike."

The Department pointed out that the New York price for spot rubber (Ribbed Smoked Sheet No. 1) averaged 17.56 cents a pound in 1949, but had reached 34 cents by the first of June. This trend, said the Department, is such as to create anxiety as to the future well being of natural rubber producing areas. It could lead to a decreased demand for natural rubber and to higher prices for rubber products.

Some observers saw in the background the implication that the United States would be willing to step up its production of synthetic rubber if the price of the natural product went too high. Underlying the importance of synthetic rubber, the State Department cited the comment by the United States delegate at a meeting of the Rubber Study Group in Brussels, who said: "As purchasers of natural rubber we wish to avoid wide speculative swings in the price of this major raw material. As major producers of synthetic rubber, we can scarcely ignore price movements of a competitive product."

### *Reasons for Announcement*

Some sources are of the opinion that the State Department's announcement came principally to counter criticism by American rubber traders. The Department is particularly sensitive about reports, allegedly circulating throughout the trade, that it is pleased with skyrocketing natural rubber prices. As the price of natural rubber rises, dollar earnings in the Far East rise and this tends to thwart Communism in that area.

Another reason for the announcement was the hope that it would have a bearish effect on the market. This was admitted by the Department. However, experts in Washington doubted, at the time of the announcement, that the action would have much effect marketwise. Nevertheless, within the next few days natural rubber prices in world markets dropped sharply. At Singapore, the market experienced its worst break in many years with quotations at one time off about 5 cents a pound.

London dealers asserted one factor causing the sharp selling in the East was a warning by Sir Hylton Poynton, deputy undersecretary of state for colonies, that the price of natural rubber had reached a dangerously high level. They also said that an unsettling influence was the U. S. Government's plan to increase the output of synthetic.

Recent statistics issued by the Rubber Study Group disclosed that Indonesian exports, which amounted to only 22,000 tons in January of this year, rose to just over 60,000 tons in April. This indicates that hoarding of rubber in Indonesia, which had been a factor in initiating recent steep advances in world rubber prices, is coming to an end.

Another factor which is believed to have stemmed the rising rubber price was the action taken in mid-June by the Indonesian Government to impose a new duty on exports of rubber. From July 1 to August 31, Indonesian dealers will have to pay an export duty of 34.6 cents (Indonesian currency) on each kilogram of rubber they ship overseas. This is equivalent to nearly 5 cents a pound in American money. This action was expected to result in heavily increased shipments prior to July 1.

A third circumstance that built pressure against high prices for natural rubber was the announcement by the Office of Rubber Reserve that it was speeding synthetic plant operation and expected to have the production of GR-S up to 35,000 tons a month by July, compared with an output of 19,000 tons in January.

On the other side of the ledger, as one market observer commented, the supply and demand situation for rubber appeared to be under the domination of record high consumption of rubber in the United States, rising consumption in most other nations, and new supplies dwindling until just recently.

### *Indonesian Producers Reply*

On June 27, the Indonesian Embassy in Washington, D. C., informed the State Department that it had picked the wrong culprit in blaming rubber producing countries for recent rises in natural rubber prices. Commercial Counsellor Mohammed Ismail Thajeb told the Department that current high prices stem primarily from miscalculations by the American tire industry in anticipating demand last fall and winter.

The Indonesian official observed that the American rubber industry carried low stocks in expectation that currency devaluations would bring lower natural rubber prices and in fear of an industrial recession in the United States. These assumptions did not work out, said Mr. Thajeb, and "replenishment of stocks in addition to a steadily increasing demand from consumption had their effect on prices."

Mr. Thajeb also declared that natural rubber is "undervalued" in relation to the prices of products which Indonesia must buy from the United States. He warned that a decrease in the price of natural rubber would seriously affect the supply. At present prices, Indonesia will produce the 520,000-ton goal announced in May at the Rubber Study Group Meeting in Brussels.

### *Litchfield Issues Statement*

According to a statement issued by P. W. Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., failure of the U. S. Government to maintain an adequate working inventory of GR-S was a major factor leading to the price rise in natural rubber. Mr. Litchfield stated that if an inventory of 200,000 tons of GR-S had been maintained by the Government and made available to industry, the price of natural rubber would not have advanced to the current high level.

The Goodyear executive pointed out that synthetic rubber stocks were allowed to dwindle last fall and production was curtailed as consumption of GR-S began to decline. Consequently, he said, the increased demand for synthetic this year as the price of natural rubber began to rise has reduced the Government inventory of GR-S to about 20,000 tons, or about 10% of an adequate working stock. He urged an immediate substantial increase in GR-S production.

### Reactivate Synthetic Plants

**Just as this issue went to press word was received that the RFC had announced a decision to reactivate one of the GR-S plants, one of the butyl rubber units, and a butadiene plant. The GR-S plant to be reactivated is that at Port Neches, Texas, which has a rated capacity of 75,000 long tons. The butyl unit is located at Baton Rouge, La., where two of three units are already in operation. The butadiene plant, with a production capacity of 50,000 tons, is located at Houston, Texas. When reactivation of these units is accomplished production of GR-S will be at the rate of 500,000 long tons while that of butyl will be approximately 75,000 long tons per year. No indication was given as to which companies will operate the reactivated facilities.**

## Western Electric Plant Addition

Western Electric Co. is presently constructing a $2,000,000 addition to its Point Breeze plant in Baltimore, Md. When completed early next year, the additional space will be used to manufacture a new type of jacketed wire for drop wires such as lead-in connections from telephone poles to household installations. The plant addition will house two 25-channel electroforming machines which will be used to put copper coating on wire. The equipment, to be operated continuously 24 hours a day, seven days a week, will provide all the copper steel requirements of the Bell system. The plant will require more than 2,000 tons of steel wire and 1,000 tons of copper annually. Because the electrolytic treatment process is largely automatic, there will be little change in employment, according to a company spokesman. The Baltimore division is the Bell System's sole source of telephone cord and coaxial cable.

# 8 RUBBER BLACKS
the only complete line

# 1 SUPPLY SOURCE
covering all your needs

MPC
EPC
VFF
HAF
FF
FEF
HMF
SRF

**for full list please turn page**

• COLUMBIAN COLLOIDS •

**COLUMBIAN CARBON CO. • BINNEY & SMITH CO.**

MANUFACTURER DISTRIBUTOR

MPC (Medium Processing Channel)

**STANDARD MICRONEX**

◆

EPC (Easy Processing Channel)

**MICRONEX W-6**

◆

VFF (Very Fine Furnace)

**STATEX-K**

◆

HAF (High Abrasion Furnace)

**STATEX-R**

◆

FF (Fine Furnace)

**STATEX-B**

◆

FEF (Fast Extruding Furnace)

**STATEX-M**

◆

HMF (High Modulus Furnace)

**STATEX-93**

◆

SRF (Semi-Reinforcing Furnace)

**FURNEX**

◆

**COLUMBIAN CARBON CO.**
MANUFACTURER

**BINNEY & SMITH CO.**
DISTRIBUTOR

## LITCHFIELD MARKS 75th BIRTHDAY AND 50th YEAR WITH GOODYEAR

The month of July, 1950, marks for Paul Weeks Litchfield, chairman of the board of the Goodyear Tire & Rubber Co., his 75th birthday and his 50th year as an executive of the corporation. Mr. Litchfield started his business career as a $9 a week engineer and rose to the position he holds today. Born in Boston, Mass., on July 26, 1875, he was educated in the public schools of that city. Entering the Massachusetts Institute of Technology, he elected chemical engineering as his course and was graduated in 1896 with a bachelor of science degree.

His first significant job was with a bicycle tire factory in Reading, Mass. For this position he was paid $9 per week. Three years later the company opened another plant at Chelsea, Mass., and Mr. Litchfield was made assistant superintendent. In these positions he gained his initial experience in the design and production of automobile tires, leading him on a long, illustrious career.

Meanwhile in Akron, Ohio, Frank A. Seiberling had organized a company which he called the Goodyear Tire & Rubber Co., named in honor of Charles Goodyear, discoverer of vulcanization. Mr. Seiberling needed a good production man and turned to Paul Litchfield, whose ability was becoming known throughout the new industry. Mr. Litchfield joined Goodyear in July, 1900, as superintendent of all production at a salary of $2,500 a year.

### *Early Career With Goodyear*

Continuing his keen interest in the development of automobile tires, Mr. Litchfield in 1901 experimented with devices to keep the tires on the cumbersome rims of the automobiles of that day and brought out the detachable side-flange tire, forerunner of the "straight-side" tire.

It was shortly thereafter that Mr. Litchfield decided that tires should be built to absorb road shock, not resist them. This led to the development of the "straight-side" tire by Goodyear, semi-rigid at the base but flexible to absorb the bumps of rough roads. The tire was held to the rim by a new type braided wire "head." The company launched an intensified promotion of this Litchfield-envisioned tire in 1905, and eventually it became standard throughout the industry, replacing the clincher type.

In 1908, he became a member of the company's board of directors. During this time he redesigned the diamond tread that became the famous Goodyear "All-Weather" non-skid tire. He became interested in aeronautics in 1910 and designed the first pneumatic tire for airplanes and formed an Aeronautics Department at Goodyear. Eventually this department expanded over a 40-year period to produce hundreds of military and observation balloons and some 100 airships for the United States in World War I; the dirigibles U. S. S. Akron and Macon; the Goodyear "blimps"; the stratosphere balloon, and 168 Navy patrol and training airships in World War II.

In 1913, Mr. Litchfield organized the "Flying Squadron," composed of picked men trained in every operation within the company so that in cases of emergency there were always trained personnel available. In that year, he designed a new, multiple-ply cord for tires that proved so satisfactory that in 1917 the Government specified it for military use.

Paul Weeks Litchfield

Mr. Litchfield was made vice-president of Goodyear in 1915. In 1916, his continued quest for improved tire cord prompted the company to buy its own fabric mills and start producing the first long staple cotton in America on experimental farms in Arizona. The year also marked the debut of the first pneumatic cord truck tire.

The rush of World War I activity and the short but ill-fated period of prosperity afterwards nearly drove Goodyear into bankruptcy in 1920. The founders of the company were forced to relinquish control and resign as officers. A banking group took charge, naming E. G. Wilmer as president in March, 1921. The functioning of the plant was left in Mr. Litchfield's hands, with G. M. Stadelman in charge of sales. The company was revived despite heavy financing charges and in 1923 Mr. Wilmer became chairman of the board, Mr. Stadelman president and Mr. Litchfield vice-president and factory manager. When Mr. Stadelman died in 1926, Mr. Litchfield was chosen president. He was re-elected president of the company in 1930 and elected chairman of the board.

### *Data From 1930 to Present*

In 1931, Goodyear launched the U. S. S. Akron, the largest airship built to that time. This marked a high point in Mr. Litchfield's life which was commemorated a year later when the Aeronautical Division of the American Society of Mechanical Engineers awarded him the second "Spirit of St. Louis" medal for "meritorious service in the advancement of airship design and construction in America."

In the next few years, Mr. Litchfield was selected by the tire industry to be one of a four-man fact-finding committee to draft an industry code for the National Industrial Recovery Act. In 1936, he was appointed to the National Business Advisory Council by the Secretary of Commerce.

In 1940, Mr. Litchfield announced he was relinquishing the title of president although retaining the board chairmanship as chief executive officer of Goodyear. Edwin J. Thomas, who started in 1916 as a stenographer and later became Mr. Litchfield's secretary, company personnel manager, superintendent of the California plant, managing director in England, and assistant to the president, was named as president.

With the outbreak of World War II, Mr. Litchfield played a major part in the vast American program of synthetic rubber production. Goodyear Aircraft during World War II ranked as one of the country's ten largest aircraft companies. Military tires, gas masks, rubber life rafts, bullet sealing fuel tanks and scores of other military products began to flow from the tire factories in Akron. Goodyear operated synthetic rubber plants in addition to its more than 30 regular plants and operations.

Shortly after reaching the age of 70 in 1945, Mr. Litchfield in the company of other rubber executives and State Department officials flew to England to confer with British and Dutch representa-

tives on post-war problems involving both natural and synthetic rubber. He also visited Goodyear plants and investigated future market potentialities.

During the current post-war period he has been an avid air traveler and business trips have taken him all over the world. In 1946, his travels included Alaska and Mexico. In 1947, he opened a new tire factory in South America. He inspected company plants in South America in 1948 and in 1949 visited the Philippines and Japan.

A member of the City Club, Portage Country Club and the University Club of Akron, Mr. Litchfield also is a member of the Akron Chamber of Commerce and served for 30 years on the board of the University of Akron. He is past president of the Rubber Manufacturers Association, former director of the U. S. Chamber of Commerce, and executive board member of the Boy Scouts of America. He belongs to many technical and fraternal associations and is a 33rd degree Mason.

During his long career in the rubber industry, Mr. Litchfield has received numerous awards and decorations. He was awarded the President's Certificate of Merit for Goodyear war production, and a number of foreign decorations. He has also been awarded an honorary degree as a doctor of science from the University of Akron. Mr. Litchfield is also the author of two books, "Autumn Leaves" and the "Industrial Republic."

### Hercules Introduces Defoamer 4

Hercules Powder Co., Wilmington, Del., has introduced Defoamer 4, a new effective defoaming agent supplied in 2½ pound brick form. The brick will make about 40 gallons of a final dispersion at 0.75% solids. The company states that the product is economical to use and provides emulsions of excellent stability. A typical procedure for preparing a dispersion using Defoamer 4 calls for 20 gallons of water in a tank which is equipped with a high-speed mechanical mixer. After the water is heated to 160° to 170° F., the brick is added. The mixture is agitated vigorously until the brick is completely melted and well dispersed. In the next step, 20 gallons of cold, presoftened water is added. The final emulsion temperature should be below 115° F. If a concentrate lower than 0.75% solids is desired, additional soft water may be added.

### Goodrich Expands Plastic Research

A new program of research and development in vinyl upholstery for furniture and other applications has been announced by the Plastics Division of the B. F. Goodrich Co., Marietta, Ohio. Greater attention will be given to improved constructions designed to serve new uses and the special requirements of the furniture and allied industries. Comprehensive Fabrics, Inc., national distributor of Goodrich Koroseal materials, as well as B. F. Goodrich, will concentrate on designing as well as merchandising in the expanded program.

### Injury Rates in 1949

The accident frequency rate for employees in the rubber industry, based on the number of disabling injuries per 1,000,000 man-hours, was 5.10 in 1949, a reduction of 39% from the year before, according to the National Safety Council. The accident severity rate, based on the number of days lost per 1,000 man-hours, was .51, a reduction of 22% from the previous year. The frequency rate was 10.14 for all industries in 1949 and the severity rate was 1.02. Rubber was the fifth safest of 40 basic industries in frequency in 1949 and 11th in severity.

## C.I.C. RUBBER DIVISION MEETING HELD ON JUNE 21 IN TORONTO

Approximately 90 members and guests attended the annual meeting of the Rubber Division of the Chemical Institute of Canada, held on June 21 at the Royal York Hotel in Toronto, Canada, in conjunction with the 1950 Conference and Exhibition sponsored by the parent organization. The divisional meeting featured the presentation of eight technical papers, in morning and afternoon sessions, and the election of officers for the 1950-51 term. The meeting was presided over by J. Ramsay (Miner Rubber), current chairman.

Titles and authors of the eight papers presented were as follows: *A Study of Styrene-Butadiene Copolymers,* by E. B. Storey and H. Leverne Williams (Polymer Corp.); *Postwar Review of USF Rubber,* by J. McGavack (U. S. Rubber); *The Development of Some New Special Purpose Rubbers,* by T. L. Davies (Polymer Corp.); *The Effect of Mechanical Aggregation on the Dispersion Characteristics of Carbon Black,* by E. M. Dannenberg and C. A. Stokes (Cabot).

Also, *Performance Evaluation of Cold Rubber in Tires,* by I. J. Sjothun and J. L. Dum (Firestone); *The Measurement of Strains on Tires,* by D. L. Loughborough (Goodrich); *The Vulcanization of Neoprene,* by A. M. Neal (DuPont); *Butadiene-Styrene Resinous Copolymers,* by J. D. D'Ianni, L. D. Hess, and W. C. Mast (Goodyear). Abstracts of all of these papers, with the exception of that delivered by Mr. Sjothun on cold rubber, appeared in the May, 1950, issue of RUBBER AGE.

In his paper, Mr. Sjothun stated that cold rubber is now being extensively used in tire treads and retreading materials to provide better wear. Comparing the performance of natural rubber and the synthetic cold rubber in tires, he reported that natural rubber gives better traction on ice and snow but that cold rubber gives better traction on wet pavement. The latter improvement is considered more vital to public safety than improved traction on ice and snow because of the lower speed of travel on ice and snow-covered streets and highways. According to the speaker, however, cold rubber is still not competitive with natural rubber for use in heavy service tires.

#### *Report on Specialty Products*

An interesting, unscheduled report on specialty rubber products for use in severe cold weather was presented at the meeting by J. Glen Gay of the Defence Research Board of Ottawa. Briefly reviewing the military need for a rubber which will stand up satisfactorily under arctic conditions, Mr. Gay disclosed that some 15 separate and distinct small rubber products made of XPR-D-70, the experimental polymer developed by the Polymer Corporation, were recently used in "Operation Sweetbriar" in the Arctic. Although only preliminary test results are available, Mr. Gay said, they already indicate that this polymer has a cold temperature flexibility superior to all others evaluated to date. The rubber parts involved were produced by various Canadian rubber manufacturers.

At the business meeting held during one of the technical sessions, the Nominating Committee presented the following slate of officers for the 1950-51 term: *Chairman,* J. T. Black (Polymer Corp.); *Vice-Chairman,* N. W. Smith (Dominion Rubber); *Secretary-Treasurer,* T. L. Davies (Polymer Corp.); *Executive Committee Members,* Bruce Marr (Naugatuck Chemical), George Stevens (Goodyear), and Eric Bolton (Goodrich). The nominations, presented by Harold Deline (Dunlop), were unanimously approved.

#### *Other Technical Sessions*

Papers of interest to rubber technologists were presented at some of the other technical sessions held by various divisions during the 1950 Conference and Exhibition. Among these were the following: "Some Observations on the Russian Butadiene Process," by I. L. Murray (Carbide & Carbon Chemicals); "Process Development in the Pilot Plant," by C. W. Gates (Nautatuck Chemical); "Synthetic Latices as Raw Materials for the Coatings Industry," by O. R. McIntyre, D. A. Taber, and A. E. Young (Dow Chemical); "Electron Microscope Studies of Polyvinyl Acetate Latices," by A. Pupre and J. D. Boadway (Shawinigan Chemicals); "Emulsion Copolymerization at Sub-Freezing Temperatures," by R. J. Orr and H. Leverne Williams (Polymer Corp.), and "Beta-Aminoethylcarbazoles," by R. H. F. Manske and M. Kulka (Dominion Rubber).

In a talk given by Arnold H. Smith, president of Monsanto (Canada) Ltd., during the convention, it was revealed that expansion of Canada's chemical industry now under way or projected for the current year is close to the $100,000,000 mark. Mr. Smith indicated that Canada is now in a position to supply its national needs for a number of materials on which it formerly had to lean on imports. As an example he pointed out that whereas in 1947 Canada imported 4,762,000 pounds of polystyrene valued at over $2,000,000, today there is no longer any need for any such imports.

## PROMOTIONS AND TRANSFERS OF FACTORY AND DEVELOPMENT PERSONNEL AT VARIOUS GOODYEAR PLANTS

R. W. Maney

L. D. Treleaven

C. R. Washburn

L. H. Bennett

P. W. Drew

A series of promotions and transfers affecting factory and development personnel at its plants in Los Angeles, Topeka and Akron was recently announced by the Goodyear Tire & Rubber Co., as follows:

Robert W. Maney, in charge of tire production at Plant 2 in Akron, has been named plant manager at Los Angeles, succeeding Frank A. Steele who is retiring on September 1 after 40 years of continuous service with the company. Mr. Maney joined Goodyear after being graduated from the University of Kansas in 1929, and has held numerous positions in production and personnel operations, including that of supervisor of production at the Gadsden plant.

C. R. Washburn, technical superintendent at Topeka, has been transferred to a similar position at Los Angeles, succeeding Philip W. Drew who has been recalled to Akron for a new and important assignment. Mr. Washburn has been with Goodyear since being graduated from M.I.T. in 1926 and has served in the Akron, Toronto and Java plants. Mr. Drew, who joined the company as a tire builder in 1925, has moved progressively through the ranks and has been technical superintendent at Los Angeles since August, 1946.

L. H. Bennett, chief chemist at the Topeka plant, becomes technical superintendent at that plant, succeeding Mr. Washburn. Mr. Bennett is a graduate engineer of the University of Alabama, and joined Goodyear in 1934 as a member of the production and engineering squadrons. In the 1945-49 period he was chief chemist at the Wolverhampton, England, plant.

L. D. Treleaven, a development compounder at Akron, has been shifted to the Topeka plant as chief chemist, succeeding Mr. Bennett. Mr. Treleaven is a native of Columbus, Ohio, and a graduate of Ohio State University. He joined the company in July, 1946, as a factory office trainee, moving to compounding later in the same year. During World War II Mr. Treleaven served with the Corps of Engineers of the U. S. Army.

### National Lead Personnel Changes

Natonal Lead Co. has announced four changes in its research personnel. Dr. F. J. Williams, technical director of the Brooklyn, N. Y., research laboratories, has been transferred to the Baroid Sales Division laboratories at Houston, Tex., to take over duties of directing Baroid research activities. Dr. J. A. Orsino has been named technical director of the Brooklyn laboratories succeeding Dr. Williams. Dr. Orsino, since October of 1949 has been assisting Alex Stewart, director of company research, in coordination and integration of research and development for all the company's laboratories. E. K. Zimmerman, of the Titanium Division laboratories in New York City, in addition to his other duties, will take over the direction of the pigment-paint research and development activities in the Brooklyn laboratories. D. S. Bolley, who has directed organic research and development in the Brooklyn laboratories since 1940, has been transferred to the Baker Castor Oil Co.

### Kraft Named Mid-West Agents

Kraft Chemical Co., Chicago 8, Ill., has been appointed Midwest sales representatives for Better Finishes & Coatings, Inc., of Newark, N. J. Kraft will carry substantial warehouse stocks of the Better Finishes line in Chicago, Detroit and at other key points. Featured among BFC products is the extra high quality technical grade chromic acid flake, of which the Newark firm recently announced commercial production.

### Nichols Forms Dryer Division

Nichols Engineering & Research Corp., 70 Pine Street, New York 5, N. Y., has announced the establishment of its Nerco-Niro Spray Dryer Division. The new division will coordinate its experiences, engineering and research with those of A/S Niro Atomizer, Copenhagen, Denmark, who have engineered and installed over 200 industrial spray drying plants in 23 foreign countries for the production of a wide range of organic and inorganic products. The first installation in the United States is now under construction for a plant in New Jersey. Except for the atomizers, which are the heart of the Nerco-Niro Spray Dryers, all parts are manufactured in the United States. The atomizers will continue to be manufactured in the precision workshops of Copenhagen by skilled and experienced mechanics and will be kept in stock in the United States.

### Webnix 33 Anti-Webbing Agent

Crusader Chemical Co., 80 Fifth Avenue, New York 11, N. Y., is now distributing Webnix 33, an anti-webbing agent for liquid latex compounds. The product is a milky white emulsion of specially selected materials having foam destructive properties blended to exert their maximum effects. Webnix contains 52% active ingredient, by weight, and 36% non-volatile components. The material is added to latex compounds in the proportions of about 0.5 to 2.0 parts wet weight per 100 parts of latex compound, and is most effective shortly after being introduced into the latex compound.

### Transfer Marvinol Sales Office

Transfer of sales and technical service headquarters for Marvinol vinyl resins from Baltimore, Md., to Naugatuck, Conn., has been announced by the Naugatuck Chemical Division of the U. S. Rubber Co. The move, which became effective June 12, is aimed at broadening research activities in vinyl resins and improving customer service. All laboratory equipment at Baltimore has been moved to Naugatuck. In addition, Marvinol sales and technical service personnel now have available to them the extensive laboratories and testing equipment of the Naugatuck Chemical plant. The result is an expanded vinyl research and development program which is more closely coordinated with customer requirements and the overall work of the division. Approximately 65 sales and technical service personnel have moved to Naugatuck, including Harold M. Parsekian, manager of vinyl sales, who will make his headquarters there.

### New Re-Activating Cement

A dry, tack-free coating for application to felt, matting sponge, cork and paper has been developed by the Rubber Latex Co. of America, Delawanna, N. J. Materials coated with this adhesive may be cut, punched or slit without difficulty, according to the manufacturer. When the coated parts are moistened with naphtha or toluol, they are easily and permanently adhered to metal, glass, wood and other difficult surfaces. The adhesive is light gray in color and may be applied by knife, brush or spray.

## RUBBER CONSUMPTION IN MAY SETS ALL-TIME RECORD OF 110,000 TONS

Consumption of new rubber in May by United States manufacturers set a new record of 110,000 long tons, according to preliminary statistics released by the U. S. Department of Commerce. Synthetics and natural rubber shared about equally in the 14,000 ton increase over April, but percentagewise, the consumption of GR-S rose twice as much.

In its release reporting on rubber consumption in May, the Rubber Manufacturers Association stated that synthetic rubber consumption totaled 45,300 long tons, up 19% over the 38,037 tons for April; natural rubber consumption was 63,937 long tons, up 10.5% over the April figure of 57,816 long tons; and the use of reclaimed rubber, which is not calculated as part of total new rubber consumption, amounted to 24,458 long tons, up 14% over the 21,463 ton April figure.

The RMA stated that since February the proportion of synthetic rubber use to total new rubber has increased steadily from 36% to nearly 41.5% of the total monthly consumption. Some of the increase in the use of synthetic rubber is attributed to the shortage of natural rubber at nearly comparable costs.

On the basis of its figures, the Department of Commerce estimates that total use of new rubber during the first five months of this year amounted to 486,903 tons, an average of 97,380 tons a month. A monthly consumption of 90,000 tons during the remainder of 1950 would result in an annual consumption of 1,117,000 tons, close to the record of 1,121,000 tons set in 1947.

### *World Production Figures*

The Department estimates world production of natural rubber in April at 140,000 tons, exceeding consumption during the same month by 10,000 tons. The April output brought the production total for the first four months of 1950 to 507,500 tons, up 37,500 tons from the figure for the corresponding period last year.

Exports from Indonesia during April, at 60,049 tons, set a post-war record. The Indonesian total included 17,366 tons of estate rubber and 42,683 tons from native sources. It is estimated that about 25,000 tons of estate rubber, accumulated since the 1st of the year, remain in Indonesia.

World stocks of natural rubber, excluding Russian stocks, and excluding Government stocks in this country, the United Kingdom and France, are estimated at 692,500 tons at the end of April, compared with 715,000 tons at the end of 1949. Stocks in consuming countries at the end of April were 265,000 tons, unchanged from January 1. World stocks of synthetic rubber at the end of April stood at 95,000 tons, a reduction of 15,000 tons since January 1.

Imports of natural rubber into Russia during the first four months of 1950, included above as consumption, amounted to only 11,000 tons, compared with 47,500 tons in the same period of 1949. Estimated foreign consumption outside of Russia increased about 18,000 tons in the four months compared with 1949.

The Department has estimated rubber production in British Malaya during April of this year to be 49,076 long tons, compared with 45,882 long tons in April of 1949.

During the first three months of 1950, production in Malaya was 6.9% below that of the corresponding quarter last year, but the increased April output reduced this lag to 4.2% for the four-month period. The decrease in the first quarter of this year was not considered significant, as it resulted partly from excessive rains and partly from the natural ending of heavy yields after continued tapping since 1946. There is little evidence that domestic disturbances contributed to the drop.

### *Indonesian Government Statement*

The United States of Indonesia, under date of June 27, issued a statement regarding held-back stocks of rubber and the general rubber supply and price situations. Although the Indonesian Government some time ago had considered anti-hoarding measures to move above-normal rubber stocks out of the country, it now appears that such measures are no longer necessary. The above-normal stocks are now reported as being of little importance. Extra heavy exports in March, April and May brought about equalization with small shipments in January, it was asserted. Total shipments from Indonesia in the first four months of this year exceeded the exports of the like period in 1949, the statement pointed out.

Elsewhere in this issue it is reported that the Indonesian Government had ordered substantial increases in the rubber export tax as of July 1. This move was intended to force stocks on hand out into the open market to avoid the extra taxes on the July 1 deadline.

Meanwhile, stocks of natural rubber, wet and dry combined, in all hands in the states of the Malayan Union and the separate city of Singapore at the end of May increased sharply to 137,548 long tons, highest month-end level since the end of January, 1949. Rubber production in Malaya in May amounted to 56,768 long tons, up substantially from the 49,076 tons in April and exceeding the 52,069 long tons produced in May, 1949. Malayan exports in May, exclusive of Singapore, amounted to 58,912 long tons, well above April exports of 48,924 long tons. Total exports in May from all Malayan ports including Singapore, wet and dry combined, amounted to 78,427 long tons vs. 68,059 long tons in April and 64,323 long tons in May, 1949.

### Rubber Chemicals Production

Production of rubber processing chemicals in the United States during 1949 totaled 79,900,000,000 pounds, 16.8% less than in 1948, the United States Tariff Commission recently reported. Preliminary figures showed sales of 61,900,000,000 pounds valued at $30,400,000,000, compared to 71,700,000,000 pounds valued at $36,400,000,000 during 1948. Output of cyclic rubber processing chemicals, roughly 85% of the total, dropped less than the output of acyclics.

### Develop PB Synthetic Rubber

A new synthetic rubber, made without critically short styrene, has been developed by the Phillips Petroleum Co. in cooperation with the Office of Rubber Reserve. Limited road tests indicate that the new rubber, called polybutadiene or "PB" rubber, is superior to GR-S and perhaps to natural rubber for tire treads. It may even be equal to cold rubber in quality, the company said. The new rubber requires no styrene since it is made completely from butadiene. The production of butadiene, made from petroleum, can be increased in existing plants to meet the present heavy demand for synthetic rubber, the company maintains. Previous efforts to make polybutadiene synthetic rubber commercially were unsuccessful because the rubber obtained was difficult to process and had poor physical properties. Polybutadiene rubber of a quality suitable for use in tires was finally obtained in Phillips' laboratories by making it much softer than usual with a modified recipe and at moderately low temperatures. In the new process, high abrasion furnace carbon black is mixed with the polybutadiene latex before conversion to solid rubber. This development resulted from a research program supported by ORR utilizing Phillips' personnel and facilities. Production of the new rubber for use in the manufacture of thousands of tires for further proving on highways had been scheduled by ORR for June.

### New Accelerator for Neoprene

NA-22 (2-mercapto imidazoline), a new general purpose accelerator for use with the various types of neoprene, has been introduced by the DuPont Rubber Chemicals Division, Wilmington, Del. The new material is a white crystalline powder, with a specific gravity of 1.43 and a melting point not lower than 195°C. It has excellent storage stability, involves no health hazard when used in recommended amounts, and is moderately soluble in water, ethanol and methanol, slightly soluble in acetone, and essentially insoluble in ethyl acetate, gasoline, carbon tetrachloride and toluene. According to DuPont, compounds containing NA-22 cure rapidly at normal vulcanization temperatures to attain high states of cure. Such compounds, however, are said to be sufficiently safe to be processed under most factory operating conditions. The use of the new accelerator is also said to result in compounds having high resilience and low compression set. A technical bulletin on NA-22 is available from the company on request.

## CANADIAN HIGH POLYMER FORUM FEATURES INTERESTING PAPERS

A number of interesting papers were presented at the Canadian High Polymer Forum held on June 15 and 16 in the auditorium of the National Research Council at Ottawa, Canada. The Forum was held under the sponsorship of the Chemical Institute of Canada with the cooperation of the National Research Council. Titles, authors and abstracts of some of the papers of direct interest to rubber technologists follow:

*Determination of Rate Constants in Solution Polymerization Initiated Photochemically*, by C. McDonald, C. Sivertz, and G. Trick (University of Western Ontario): It is shown how the kinetics leading to macromolecules can be studied in terms of small molecules which are models of functional groups in the macromolecule. It is further demonstrated that certain velocity constants involved in the ordinary peroxide initiation of polymers can be more easily studied by utilizing photochemical activation. In this way the attack of mercaptan radicals on styrene and 1-pentene is described. The activation energies, steric factors and half life of the kinetic chains involved are determined. Finally the importance of this kind of knowledge in polymer synthesis is made clear.

*Kinetics of the Cross-Linking Reaction in a Redox Emulsion Polymerization System*, by R. M. Brown and C. A. Winkler (McGill University): A study has been made of the effect of polymerization temperature on the gel point and modifier requirements of a butadiene-styrene polymerization system initiated by cumene hydroperoxide and an iron-Kalex activator. For a constant initial concentration of modifier, the gel point has been found to be significantly raised with lowered polymerization temperature. This indicates that the cross-linking reaction is more sensitive to temperature than the propagation reaction, and it is possible to calculate the difference in activation energy of the two reactions. This investigation emphasizes the difference between controlling the gel point by polymerization temperature and by modifier concentration as the latter does not suppress the cross-linking reaction, but merely limits the polymer chain length, thus preventing the three dimensional network from being too extensive.

*Indications from Viscosity Measurements of Branching of High Polymers*, by J. A. Manson, A. T. Brown, and L. H. Cragg (McMaster University): The viscosity of a polymer solution is dependent upon a number of factors: (a) the solvent, (b) the solute, (c) the temperature, (d) concentration, (e) rate of shear, (f) history just prior to measurement. A phenomenon similar in all respects to thixotropy is observed with Polysar-S solutions but is not evident with Hevea or polyisobutylene solutions. In the Staudinger equation $[\eta] = KM^a$, a was 1 for low molecular weight systems but it was not 1 for most polymer solutions. Both K and a should be sensitive to the shape of the solute molecule. For rubber and polymer molecules, the value of a approaches the point of 6 which however, is not independent of the solvent. Recent experimental work is described and the results obtained discussed.

*A Study of the Copolymerization of Butadiene and Acrylonitrile*, by W. H. Embree, J. M. Mitchell, and H. L. Williams (Polymer Corp.): Copolymers of butadiene and acrylonitrile are the major products next to copolymers of butadiene and styrene, but no comprehensive investigation of this system has been published. Preliminary work was done using a typical high temperature recipe and the major investigation using a typical low temperature recipe.

The bound nitrile, as conversion of a 75/25 butadiene/acrylonitrile charge increased, decreased from a value higher than 25 to 25 at 100% conversion. This indicated that the first polymer formed was richer in acrylonitrile than the charge and that the new polymer being formed at higher conversions was poorer. The reverse was true for a 25/75 butadiene/acrylonitrile charge. This illustrates the tendency of butadiene and acrylonitrile to alternate in the copolymer. The charge ratio of butadiene to acrylonitrile also has marked effects upon the rate of conversion and the stability of the final latex.

The modifier disappearance curves appear to be essentially similar to those observed in the preparation of Polysar-S, that is, the regulating index or chain transfer coefficient approximates that for dodecyl mercaptan in a fatty acid soap emulsified system. The effectiveness of the tertiary mercaptan seemed to depend upon the ratio of butadiene to acrylonitrile, however, to a greater extent than is observed in the case of butadiene/styrene systems.

The intrinsic viscosity rises with conversion and is diminished with increasing modifier charges. Anomalous results were obtained with old samples of latex. Considerable difficulty was experienced in finding suitable solvent/non-solvent pairs for the intrinsic vistex viscosity determination.

*Osmotic Pressure Studies of Polyvinyl Acetate Polymers in Various Solvents*, by L. A. McLeod (National Research Council): Osmotic pressure data for polyvinyl acetate polymers in several solvents have been obtained. Almost invariably the $\pi/c$ vs c plots show definite curvature for which no explanation has been found in experimental techniques. Analysis of all known sources of experimental error leads to the conclusion that the observed curvature is real. An explanation may be found in light of recently advanced statistical theories.

## CHANGES IN EXECUTIVE PERSONNEL ANNOUNCED BY U. S. RUBBER RECLAIMING

Robert Cowen — H. C. Egerton — C. H. Peterson

Jean H. Nesbit, president of the U. S. Rubber Reclaiming Co., Inc., which now maintains general offices at its Buffalo, N. Y., plant, has announced a series of promotions and changes in the executive personnel of the company. John S. Plumb, formerly vice-president and factory manager, has been named vice-president in charge of technical development. Chester H. Peterson, formerly associated with the General Tire & Rubber Co., has been appointed vice-president in charge of production. Robert Cowen, formerly a sales representative for the company, has been named vice-president in charge of sales. Charles F. Smith, previously assistant sales manager, has been promoted to sales manager. Henry C. Egerton, formerly comptroller of the company, has been appointed treasurer.

### Goodrich $1,000,000 Renovation

B. F. Goodrich Co. has begun a $1,000,000 modernization of its general and factory offices in Akron, Ohio. The most extensive program of its kind undertaken by the company, plans call for the rehabilitation of one entire building and sections of two others. About 200,000 square feet of floor space are included in the project. Work is being done in one area at a time so as not to disrupt operations of any one department. The rebuilding operations are scheduled to continue well into 1951, and will see virtually the entire office personnel of approximately 3,000 persons located in revamped quarters.

### Jones Retires from Quaker Rubber

Frank L. Jones, secretary and assistant treasurer of the Quaker Rubber Co., Philadelphia, Penna., has retired from active company service as of June 1. Mr. Jones had been associated with Quaker Rubber for 48 years having started with the company in 1902. A testimonial dinner honoring him was held on June 6.

## RUBBER TECHNOLOGY GROUP IS ESTABLISHED IN SWEDEN

The Swedish Federation of Rubber Technology (Sveriges Gummitekniska Forening) was formally established in Sweden at a meeting held in Norrhoping on April 14, 1950, with approximately 60 representatives of the Swedish rubber industry present at the meeting. According to the by-laws of the new organization it will promote the scientific and industrial progress of rubber technology in Sweden and other Scandinavian countries and will cooperate with such other rubber organizations as the Institution of the Rubber Industry and the Division of Rubber Chemistry, A.C.S.

The following officers were elected for the 1950 period: *Chairman*, Frank Holmes (Goodyear Sweden); *Vice-Chairman*, Bo Sarno (Liljeholmens Cable Works); *Secretary*, Erik Johnson (Rubber & Plastics Co.); *Treasurer*, Christer Nordenskjold (Overman Rubber). The following were elected as directors: Olle Carlson (Viskafors Rubber), Lennart Frisk (Varnamo Rubber), and Anders Rydin (Gislaved Rubber). Messrs. Holmes and Nordenskjold are credited with the suggestion for the creation of the Federation, headquarters for which will be maintained at Hamngata 12, Stockholm, Sweden.

The initial meeting of the new group got off to a good start with the presentation of four excellent papers. These were: "The Future of Natural and Synthetic Rubber," by Dr. W. J. S. Naunton (ICI); "Continuous Vulcanization of Cables from Three Hours to Twelve Seconds," by Bo Sarno; "Cold Rubber," by Frank Holmes, and "The Government's Program on Raw Materials," by S. Huss. Mr. Huss is associated with the Swedish Industrial and Trade Commission. A discussion period was held after the presentation of each paper.

Following the meeting a banquet was held at the Standard Hotel in Norrkoping, with Mr. Holmes in the chair. A number of congratulatory speeches and messages were heard and considerable optimism for the success of the Federation was sounded. The following day all of the delegates at the meeting visited the Goodyear plant and were guests of the company at a luncheon.

### Reorganize Commerce Agency

Reorganization of the Bureau of Foreign and Domestic Commerce of the Commerce Department was recently announced. The reorganization merges related activities formerly carried out by both the Office of International Trade and the Office of Domestic Commerce. The reorganization establishes an Office of Industry and Commerce (OIC), abolishing the Office of Domestic Commerce and transferring all of its responsibilities and functions to the new office; consolidates all of the industry-commodity units of the Bureau of Foreign and Domestic Commerce in the new office, and transfers the responsibilities of the Office of International Trade with respect to commodities, export controls, transportation and communication to the new office.

## Coming Events

**July 28.** Chicago Rubber Group, Outing, Medinah Country Club, Chicago.

**Aug. 6.** Northern Calif. Rubber Group, Outing, Tilden Regional Park, Berkeley, Calif.

**Aug. 8.** New York Rubber Group, Golf Tournament, Baltusrol Club, Springfield, N. J.

**Aug. 25.** Philadelphia Rubber Group, Outing, Cedarbrook Country Club, Wyncote, Penna.

**Sept. 3-8.** A.C.S., 118th National Meeting, Chicago, Ill.

**Sept. 14.** Southern Ohio Rubber Group, Engineers Club, Dayton.

**Sept. 19-21.** A.S.M.E., Fall Meeting, Worcester, Mass.

**Sept. 29.** Northern Calif. Rubber Group, Claremont Hotel, Berkeley, Calif.

**Oct. 6.** Detroit Rubber & Plastics Group, Detroit-Leland Hotel, Detroit.

**Oct. 9-10.** A.S.T.M. Committee D-11 on Rubber Products, International Meeting, Cleveland.

**Oct. 11-13.** Rubber Division, A.C.S., International Rubber Meeting, Hotel Cleveland, Cleveland.

**Oct. 17.** Buffalo Rubber Group, Hotel Westbrook, Buffalo, N. Y.

**Oct. 20.** N. Y. Rubber Group, Henry Hudson Hotel, New York.

**Oct. 20.** Boston Rubber Group, Somerset Hotel, Boston.

**Nov. 10.** Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

**Nov. 26-Dec. 1.** A.S.M.E., Annual Meeting, New York, N. Y.

**Dec. 8.** Detroit Rubber & Plastics Group, Xmas Party, Detroit-Leland Hotel, Detroit.

**Dec. 11.** Northern Calif. Rubber Group, Xmas Party, The Willows, Orinda, Calif.

**Dec. 15.** N. Y. Rubber Group, Xmas Party, Henry Hudson Hotel, New York.

**Dec. 15.** Boston Rubber Group, Xmas Party, Somerset Hotel, Boston.

**Dec. 19.** Buffalo Rubber Group, Xmas Party, Elks Club, Buffalo, N. Y.

**Jan. 26, 1951.** Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

**Feb. 28-Mar. 1-2, 1951.** Rubber Division, A.C.S., Spring Meeting, Washington, D.C.

### General Latex Named Distributor

Appointment of the General Latex and Chemical Corporation, of Cambridge, Mass., as a distributor in the New England area of Chemigum synthetic latices has been announced by the Chemical Division of the Goodyear Tire & Rubber Co. Included among latices to be handled are Chemigum Latices 200, 235 and 245.

## U. S. RUBBER CO'S REBUTTAL DENIES MONOPOLY ALLEGATIONS

In an answer filed on June 15, in Federal Court in Chicago, Ill., the U. S. Rubber Co. formally denied that it had ever operated in combination with E. I. du Pont de Nemours & Co., Inc., or the General Motors Corp. The Government filed a civil anti-trust suit against the three concerns last June 30, charging DuPont with monopolistic practices and asking that members of the DuPont family be compelled to sell their "controlling" stock holdings in U. S. Rubber and General Motors. The Government contended the three companies constituted "the largest combination of manufacturing enterprises in the country."

In its rebuttal, U. S. Rubber denied knowledge of any syndicate formed in 1927 by the DuPont family and associates. The Government charged that the syndicate was formed to buy controlling interest in U. S. Rubber stock. U. S. Rubber also denied that the three firms worked to eliminate competition through a system of secret rebates and by dividing several fields of manufacturing among themselves.

The rubber firm contended that it bought from other firms besides DuPont, and that company purchases between 1938 and 1947 totaled only $66,000,000 or $6,000,000 less than the Government claimed. It agreed that it is the largest supplier of tires and tubes to General Motors, but contended that the suit overstated the amount of business in a three-year period by $38,000,000.

### Amon Returns From European Tour

Fred H. Amon, technical director of Godfrey L. Cabot, Inc., Boston 10, Mass., recently returned from a trip to England, Scotland, France and Italy, much encouraged by the European rubber industry's reception of oil-type carbon blacks. Mr. Amon's tour included visits to the rubber companies in the countries visited, including branch plants of American tire companies. He was impressed with the fact that there is a wide interest in the manufacture of reinforcing blacks abroad. Mr. Amon also visited the new Cabot plant at Ellesmere Port, England, and discussed a system for quality control with Harry Collyer, English plant laboratory director. At both Birmingham and Liverpool, England, Mr. Amon presented a paper on the manufacture of carbon blacks before meetings of the Institution of the Rubber Industry.

### Davy Leaves Trade Association

B. G. Davy, who has been associated with the Rubber Trade Association of New York, Inc., for some thirty years, has resigned as secretary of the association because of impaired health due to overwork and the need for a complete rest. He has been succeeded as secretary by Arthur J. Garry who was formerly associated with the Rubber Trade Association of New York, the Reconstruction Finance Corp., the Rubber Reserve Co., the Rubber Distribution Corp., and other rubber interests since 1941.

## QUEBEC GROUP ELECTS OFFICERS; HOLDS ANNUAL GOLF TOURNAMENT

A new slate of officers for the 1950-51 season of the Quebec Rubber and Plastics Group was named at the annual golf tournament held on June 16, at the Granby Golf Club, in Granby, Quebec, Canada. The new officers are: *Chairman,* N. W. Smith (Dominion Rubber)*, Secretary-Treasurer,* H. A. Kushnarov (Dominion Rubber).

Members elected to serve on the executive committee for the new season include: R. G. Davies (Canadian Industries), A. G. Pinard (Canadian Resins), R. G. Rea (Monsanto). H. A. Kushnarov (Dominion Rubber), C. W. McEachern (General Latex), M. L. Cameron (Canadian Titanium Pigments), M. Renshaw (British Rubber), and A. S. Johnston (Northern Electric).

Approximately 70 members and guests participated in the golf tournament and about 90 attended the dinner which followed. Low gross honors for the day went to Mr. C. G. Croakman (Binney & Smith); low net went to H. Loiselle (Northern Electric), while second low gross went to F. S. MacLean and second low net to C. P. Dearth (Bolta Plastics). Approximately 40 prizes were awarded for the different events.

The Golf Committee included Roger Davies (Canadian Industries), R. G. Rea (Monsanto), and H. Kushnarov (Dominion Rubber).

### Deadline for Division Papers

C. R. Haynes, of the Binney & Smith Co., secretary of the Rubber Division, A.C.S., has called attention to the fact that abstracts of all papers intended for presentation at the Fall Meeting of the Division must be in his hands by August 15. As usual, abstracts must consist of approximately 400 words and must be submitted in triplicate. Three copies of the completed paper must be delivered to the secretary at the time of the meeting. As previously announced, the Fall Meeting will be known as an International Rubber Meeting. It will be held on October 11, 12 and 13, at the Hotel Cleveland in Cleveland, Ohio. Amos W. Oakleaf (Phillips Chemical) is local chairman in charge of arrangements. C. A. Hemingway (Witco) has been named chairman of the Foreign Liaison Committee. A Suppliers' Cocktail Party, of which John M. Hamilton (Binney & Smith) is general chairman and Allyn I. Brandt (Goodrich Chemical) is local chairman, will precede the divisional banquet.

### Argentine Seeks Rubber Independence

A bill creating an independent rubber industry in Argentina, sufficient to meet required consumption, was recently passed by the Argentine Chamber of Deputies, according to reports from Buenos Aires. The bill calls for an initial production of 14,000 tons of rubber annually, this amount to be secured from operation of a synthetic rubber plant and intensive cultivation of guayule plants.

### Appointed Laboratories Manager

**Dr. Arthur E. Brooks**

Dr. Arthur E. Brooks, formerly assistant to the director of research and development of the U. S. Rubber Co., has been appointed manager of the company's general laboratories at Passaic, N. J. A native of Baltimore, Md., Dr. Brooks was graduated from Johns Hopkins University in 1915 and later took his Ph. D. at the University of Chicago. He served as an officer in the Ordnance Department during World War I, and later taught mathematics and chemistry in high schools in Illinois and at McKendree College, Lebanon, Ill.

Dr. Brooks joined U. S. Rubber in 1929 as a research chemist at the general laboratories where he worked on a number of important projects. Among these was the adoption of rubber separators for use in storage batteries, and the development of Hydron, an absorptive form-lining used in molding faces of concrete structures.

From 1941 to 1944, Dr. Brooks served as technical director of the company's Munitions Division with headquarters at Des Moines. One of his major accomplishments was the installation of a program of quality control on a large scale, which resulted in huge savings to the government and contributed heavily to the war effort. He returned to Passaic in 1944 as head of the Department of Physical Research, and one year later was placed in charge of organic research. This was followed by his appointment in 1947 as assistant to the director.

Dr. Brooks has contributed several technical papers to leading scientific journals in recent years and is a member of the American Chemical Society, the American Association for the Advancement of Science, and Sigma Xi, honorary scientific society.

Small cans of oil, lighter fluid and similar liquids are said to be capped faster and more effectively with new cap spouts made of flexible Bakelite polyethylene. Already being used for packaging by a number of leading oil companies, the spouts are available in black, white and a wide range of other colors.

## RHODE ISLAND GROUP OUTING FEATURES GOLF TOURNAMENT

The Rhode Island Rubber Group held its annual summer outing on June 29, at the Metacomet Golf Club, East Providence, R. I., with approximately 150 members and guests in attendance. Fred Bartlett (U. S. Rubber) acted as general chairman for the outing. Fred Newman (Respro) served as chairman of the golf committee.

In the golfing tournament, W. Newman won honors for low gross, with A. J. Urbanski coming in second. Kickers low net was won by S. F. Long, with L. L. Longworth, John Marshall and J. Sanek taking second, third and fourth places. Joseph Gagne won high gross while E. A. Coston won high net. W. Rogers won a prize for nearest to pin on the 5th hole, and P. G. Roach for nearest to pin on the 7th hole.

The longest drive was made by A. J. Urbanski. Cass Cislo scored the most 6's, while Fred Newman scored the most 4's. Fred Bartlett won second on the 12th.

### New York Group Holds Outing

Despite a solid day of rainy weather, approximately 135 members and guests attended the annual outing of the New York Rubber Group, held on June 15 at Doerr's Grove in Millburn, N. J. Although the weather prohibited holding all of the scheduled contests, four such contests were held, winners being as follows: *Horseshoes (Quoits),* Bill Lamella (Okonite) and Bert Wilkes (Herron Bros. & Meyer); *Boccie,* C. T. Jansen and M. E. Lerner (RUBBER AGE); *Golf Driving Contest,* W. J. Sparks (Standard Oil Development); *Darts,* Bill Lamella (Okonite) and R. M. Thomas (Standard Oil Development). A number of prizes intended for winners of various events were distributed as door prizes. Entertainment (?) was furnished by a quartet consisting of Bert Wilkes (Herron Bros. & Meyer), Ed Heckman (Raw Materials), Bob Gimler (Flintkote), and M. E. Lerner (RUBBER AGE). Pete Murawski (DuPont) was chairman of the outing committee and C. T. Jansen (RUBBER AGE) acted as master of ceremonies.

### Outstanding Safety Record

According to information supplied by the Liberty Mutual Insurance Co., the Hagerstown Rubber Co., of Hagerstown, Maryland, has compiled an outstanding safety record. Up to February 1, 1950, the company has worked 1,305,741 man-hours without a lost time accident. This represents a period from March 16, 1946, to February 1, 1950, and at this writing the record is unbroken. The plant employs approximately 150 workers and has done an excellent job in providing safe working conditions for its employees. F. R. Rowe, plant superintendent, is credited with the safety program in effect at the plant. A plaque was awarded to the company by Liberty Mutual on April 11, 1950, for a job well done.

## SOUTHERN OHIO ANNUAL OUTING HELD AMIDST SUMMER DOWNPOUR

The Annual Summer Outing of the Southern Ohio Rubber Group was held on June 3 amidst summer downpours. Nevertheless, a golfing tournament was held at the Eaton Country Club, Eaton, Ohio, while the outing proceeded at McCrabb's Grove in Dayton, Ohio. A buffet luncheon and dinner were served to the group members. The following members served on the Outing Committee: Ted Argue (Inland Mfg.), chairman, and Bill Somers (Inland Mfg.), Charles Wimmer (Phillips Chemical), James Andrew (Dayton Rubber), and William Hames (Inland Mfg.). Winners in the golf tournament included the following:

*Bogie*—W. Bolin (American Zinc), Lou Keyes (Dayton Rubber), Jim Saettel (Inland Mfg.), Dan Meyers (Dayton Rubber), Milton Leonard (Binney & Smith), Russ Longanecker (Dayton Rubber), Herb Karch (C. P. Hall), and Jack Feldman (Inland Mfg.); *Putts*—Bill Somers (Inland Mfg.), Frank Newton (Dayton Rubber), Bob Davis (Inland Mfg.), Frank Woznak (Irvington Varnish), Bob Antheil (Inland Mfg.), and George Hobach (Witco). W. J. Bolin (American Zinc) and Bill Somers (Inland Mfg.) won golf club covers, while a number of other members won golf balls as prizes.

The following members won the poker tournament: Bob Sucher (Marbon), Bob Radow (Dayton Rubber), Cather Louthan (Herron & Meyer), Roy Marston (Binney & Smith), and Bob Emmett (Binney & Smith).

### Goodyear Hi-Miler Rib Tire

The Hi-Miler Rib, a new truck tire designed to deliver substantially higher mileage and at the same time give smoother wear, has been developed by the Goodyear Tire & Rubber Co., Akron, Ohio. Several factors are cited by the company as responsible for the twin accomplishment. First of these is the tire's new tread, which has been made flatter and with more rubber. The carcass is also of tougher compounds, believed considerably more resistant to heat and high speeds. Of equal importance, and accounting for the new tire's more even wear, its designers say, is a new continuous rib design. Other improvements in the new Hi-Miler which is now available in the same sizes as its predecessor, include a shoulder design of narrow, buttressed continuous ribs, zigzagged with a greater number of road-grabbing edges for maximum traction.

### Offer Butyl Rubber Dispersions

A whole new series of water-based dispersions based on butyl rubber, suitable for coating, saturating and adhesive applications, has been developed by the Naugatuck Chemical Division of United States Rubber Co., Naugatuck, Conn. Butyl rubber has established itself firmly because of good aging characteristics, freedom from light discoloration, low moisture-vapor transfer, and other properties. Availability of the new dispersions increase the usefulness of the product.

### Mason Named Sales Manager

Donald E. Mason

Donald E. Mason, formerly associated with the B. F. Goodrich Co., has been appointed general sales manager of the Colonial Rubber Co., Ravenna, Ohio. Mr. Mason was associated with Goodrich for over 8 years, specializing in special or custom molding problems. He joined Goodrich in 1938, after receiving his B.S. degree in marketing from Ohio State University. During the war years he was associated wtih the Atlas Powder Co. He rejoined Goodrich at the end of the war in the Sundries Sales Division of the Industrial Products Department. Colonial Rubber is a unit of the U. S. Stoneware Co.

### Hawkeye Rubber Is Active

The Hawkeye Rubber Manufacturing Co., of Cedar Rapids, Iowa, is now manufacturing industrial rubber tires, tire repair materials, and a wide line of molded sponge and dense rubber products for use in the automotive, household appliance and other industries. Hawkeye Rubber purchased the assets of the Midland Rubber Co. last September. Officers of the company include Elmer Freud, president; W. A. Roberts, executive vice-president, and Ben S. Handler, secretary. Mr. Roberts also functions as general manager and sales manager. Other executive personnel of the company includes Loyd Monroe, factory manager; Harvey Wahn, technical superintendent, and Ted D.Cowen, production superintendent.

### Develop SAF Carbon Black

The development and semi-commercial production of a soft abrasion furnace black (SAF) has been announced by the Phillips Petroleum Co. When used with cold rubber the new black is expected to produce tire treads having 25 to 50% better wear resistance than similar treads compounded with the best commercially available carbon black. Produced from oil by a continuous process the new black will be sold at a somewhat higher cost than the abrasion resistant blacks currently on the market.

## GOLF TOURNAMENT FEATURES DETROIT RUBBER GROUP OUTING

Approximately 270 members and guests of the Detroit Rubber and Plastics Group attended the annual summer outing held on June 23, at the Forest Lake Country Club, Pontiac, Mich. A golf tournament was the feature athletic event. Dinner and a program of entertainment followed the tournament.

William Holt (Goodall Fabrics) won low gross honors in the golf tournament; G. McCarthy (Gera Mfg.) won a prize for low net, while Ernie Storfer (Chrysler) won high score. L. W. Neale (Pioneer Latex) took first prize for the closest to cup event.

The general chairman for the outing was Ray Cuthbertson (U. S. Rubber). H. W. Neale served as chairman of the Golf Committee and took charge of awarding the prizes. Tom Halloran (Chemical Products) served as chairman of entertainment, while Walter Bauer (Brown Rubber) served as chairman of ticket sales. Ed Kvet (Baldwin Rubber), John Dudley (Chrysler) and Herb Hoerauf (U. S. Rubber) also assisted on the various committees.

Dr. H. A. Winklemann, research director of the Dryden Rubber Division of the Sheller Manufacturing Corp., will address the fall meeting of the group. The meeting will be held on October 6 at the Detroit-Leland Hotel in Detroit, Mich. Dr. Winklemann will speak on "Weather Aging of Automotive Rubber."

### Morflex 100 Vinyl Plasticizer

Morflex 100, an improved octyl phthalate type of plasticizer for vinyl resins, has been introduced by the Morton-Withers Chemical Co., Greensboro, N. C. Particularly suitable for wire coaters and film producers, the new material is said to be characterized by high efficiency, low volatility and migration, good electrical properties, and outstanding resistance to heat aging. The Burgess Pigment Co., Paterson, N. J., and Van, Horn, Metz & Co., Inc., Philadelphia, Penna., have been named exclusive sales representatives for the new plasticizer.

### Increase Yield of Guayule

Development of guayule plants which yield up to 70% more rubber to the acre than the best available during the wartime period was recently reported by B. T. Shaw, deputy administrator of the Agricultural Research Administration of the Department of Agriculture. Plant breeding operations, which were started during the year, promise even higher-yielding plants, according to Mr. Shaw, who added that guayule is now being considered as a possible commercial crop in parts of Texas and other dry areas in the Southwest.

Ross & Roberts has adopted the trade name "Reet" for its line of unsupported vinyl film and sheeting. The company's new modern plant at Stratford, Conn., is now on a full production schedule for these materials.

## BOSTON RUBBER GROUP HOLDS FOURTEENTH ANNIVERSARY OUTING

The Fourteenth Anniversary Outing of the Boston Rubber Group was held on June 16 at the United Shoe Country Club in Beverly, Mass. The day's activities included golf, softball, bowling, tennis, darts, horseshoes and other games. Approximately 450 members and their guests attended the dinner which followed the athletic activities. W. A. Maguire (United Carbon) directed the golf tournament. Directors of other events included E. Freeman (Stedfast Rubber), softball; R. Szulick (Acushnet Process), putting contest; N. W. Herthel, darts; F. Gregory, horseshoes; C. Meyer (Harwick Standard), horse racing; G. Browning, tennis; and J. E. Williamson (Tyer Rubber), bowling.

Members serving on the Outing Committee included Alan Bryant (Binney & Smith), chairman, and P. A. Uva (Avon Sole) and Harry Atwater (Hood Rubber). Prizes were awarded to members who won the different athletic events. Kicker's Handicap was won by J. Beale, G. S. Laaff, C. W. LaConture, P. Watts, R. Patrick, R. Szulick, W. Platte and R. Nippes.

Low gross winners included R. Nippes, A. E. Nelson, J. Beale and W. Richardson. Low net winners included E. G. Swanson, F. N. Barrett, J. O'Neil and E. H. Kroepel. T. A. Buskey won a prize for the longest drive; W. G. Brown for nearest pin; and J. Andrews for high gross. High net was won by H. Hartman. The putting contest was won by E. Dienen, T. C. Weaver, F. W. Bean, W. King and S. Palais.

A team representing the American Resinous Chemicals Corp. won the softball contest. The team of E. Weber and P. Blanchard won the horseshoes contest. W. Walker and B. Smart won first prize in the tennis tournament, with D. Dannenburg and G. Browning taking second prize. J. Van Volten and E. Pease took first and second place, respectively, in the darts contest. J. Corr, J. Auchterlonie and D. Leison won the first three prizes in the bowling matches.

### Details on Spring Meeting

The Washington Rubber Group, of which R. J. Devereaux is chairman, will act as host for the Spring Meeting of the Rubber Division, A.C.S. The meeting will be held on February 28, 1951, through March 2, at the Shoreham Hotel in Washington, D. C. Norman Bekkedahl, of the National Bureau of Standards, has been named chairman of the local arrangements committee.

### Washington Holds Annual Outing

The Washington Rubber Group held its annual outing and picnic on June 24, at Great Falls, Va., which is approximately 15 miles above Washington, D. C., on the Potomac River. Approximately 75 members and guests participated in the different outing events. Winners were awarded suitable prizes.

### Appointed General Sales Manager

Harold J. Alsted

Harold J. Alsted, formerly Chicago district sales representative for Sprout, Waldron & Co. of Muncy, Penna., has been appointed general sales manager of the company. Prior to accepting his first sales territory with Sprout-Waldron in 1936, Mr. Alsted was employed in the company's home office. From 1936 to 1940, he represented the company in the Southeastern portion of the United States.

## ONTARIO RUBBER SECTION HOLDS ANNUAL FIELD DAY

The Ontario Rubber Section of the Chemical Institute of Canada held its Annual Field Day on June 10 at the Rouge Hills Golf & Country Club in Toronto, Ont., Canada. Approximately 80 members and guests attended the outing which featured a golfing tournament and dinner. The following members of the Ontario Section served on the Outing Committee: *Chairman,* S. M. Murray (Chas. Tennant); *Secretary,* F. R. Gorrie (Delacour-Gorrie); *Prizes,* R. Ruebottom (Hardesty); *Golf,* E. Kent (Canada Wire) and A. Barraclough (Canadian Triangle Wire); *Refreshments,* L. V. Lomas (St. Lawrence Chemical).

Winners in the different golfing events included: *Low Gross,* C. Croakman (Binney & Smith); *2nd Low Gross,* S. M. Murray (Chas. Tennant); *Low Net,* J. W. Ansley, (Seiberling); *Low Gross—1st Nine,* J. Bullard (Dunlop Tire); *Low Gross—2nd Nine,* W. Moncur (Seiberling); *Low on #5,* R. J. Tipton (Seiberling); and *High on #11,* W. Nichol (Gutta Percha).

*High Gross,* M. Lindsay (Canada Wire); *High Gross—1st Nine,* A. Edwards (Jos. Stokes); *High Gross—2nd Nine,* G. Shiels (Dunlop Tire); *High Hole—1st Nine,* J. Ray (Dunlop Tire); *High Hole—2nd Nine,* J. A. Carr (Dunlop Tire); *Most 5's,* M. McKenzie (Dunlop Tire); *Most 6's,* C. Black (Canada Wire); *Most 7's,* E. Kent (Canada Wire); *Closest to 113,* A. Green (Jos. Stokes).

A number of valuable door prizes were distributed as another feature of the outing.

## AKRON RUBBER GROUP HOLDS ANNUAL SUMMER GOLF OUTING

The Akron Rubber Group held its annual summer outing on June 16, at the Firestone Country Club, Akron, Ohio, with approximately 560 members and guests in attendance. Following an afternoon of golf, softball and horseshoes, members enjoyed a swiss steak dinner. Charles Wimmer (Phillips Petroleum) was general chairman for the outing. Chairmen of subcommittees planning the program included: Harry Brubaker (Phillips Petroleum), golf and entertainment; William Whittaker (Herron Bros. & Meyer), prizes; L. V. Cooper (Firestone), food; Roy H. Marston (Binney & Smith), tickets; and Ralph Wolf (Columbia Chemical), publicity.

The Golf Committee included Daniel J. Doherty (Cabot), V. K. Hitch (Akron Chemical) and H. B. McCreary. Members serving on the Prize Committee included Sam A. Tanney (Tanney-Costello), E. H. Nahm (Naugatuck Chemical), Carl Totsch (Midwest Rubber Reclaiming) and William MacKay (Monsanto).

Low Gross honors were captured by John Cseh (Firestone) with a score of 72. Other golf prizes were won by Robert A. Emmett, Frank Behra, Ralph LaPorte, G. H. Twickler, J. Platner, C. W. Stalker, E. E. McMannis, Franz D. Abbott, E. R. Byers, Fred Lockhart, Alex Peresta, L. T. Unks, K. W. Cunningham, W. L. Gibson, A. S. Krivitsky, T. T. Thompson, and A. D. Ames. A special prize, a golfer's prayer rug, was awarded Harold George of the Standard Products Co.

At the outing, membership chairman Lawrence M. Baker (General Tire) announced that the Akron Rubber Group now has more than 1,000 paid members.

### Boost Natural Rubber Tube Prices

A general increase of 10% in prices of inner tubes made of natural rubber was announced by practically all tube manufacturers last month, with the new prices in effect on June 6 in most cases. The increase was initially announced by the Goodyear Tire & Rubber Co., and was quickly followed by corresponding announcements from Seiberling Rubber, Firestone, Goodrich, U. S. Rubber, and others. Goodrich also increased the price of its puncture-sealing inner tube by 5%. The increases were necessitated by higher costs of natural rubber. Only some 15% of all tubes made are manufactured from natural rubber, the balance from butyl.

### Northern California Hears Morris

Ross E. Morris, senior rubber technologist at the Rubber Laboratory, Mare Island Naval Shipyards, was the principal speaker at the May meeting of the Northern California Rubber Group, held on May 25 at the Hotel Claremont in Berkeley, Calif. Mr. Morris presented a paper on "Low Temperature Rubber Gaskets," stressing second order of transition and crystallization.

# NAMES IN THE NEWS

PAUL F. PRESTON, formerly manufacturing and engineering manager of the Chemicals Division of the Chemical Department of the General Electric Co., Pittsfield, Mass., has been appointed manufacturing manager of the Chemical Department.

HOWARD E. AMMERMAN, manager of the Service Department of the Goodyear Tire & Rubber Co., Akron, Ohio, has been awarded a 25-year service pin by the company.

DONALD J. MILLER, associated with the Monsanto Chemical Co. since 1941, has been named manager of the company's new styrene plant at Long Beach, Calif.

JOHN L. COLLYER, president of the B. F. Goodrich Co., was awarded an honorary doctor of laws degree at the 113th commencement exercises of Marietta College, Marietta, Ohio, on June 4.

THOMAS F. O'NEIL, vice-president and director of the Yankee Network, a wholly-owned subsidiary by the General Tire & Rubber Co., has been elected a vice-president of the parent concern. He is also a director of General Tire.

JOHN H. MONTGOMERY, vice-president in charge of sales and general administrative activities of Fritzsche Brothers, Inc., was recently honored by the company's officers and directors and by the active members of the Fritzsche "Quarter of a Century Club" at a dinner at the New York Athletic Club in celebration of his twenty-fifth anniversary with the company.

F. L. EGER has joined the Industrial Chemicals Division of the American Cyanamid Co. as technical representative for the sale of chemicals to the rubber industry. He will make his headquarters in Cleveland, Ohio.

RALPH H. MINER, formerly manager of the Tax and Insurance Department of the Goodyear Tire and Rubber Co., has been appointed assistant secretary of the company.

J. B. WEAVER, formerly assistant to the director of research and development of Godfrey L. Cabot, Inc., is now associated with the Research Department of Olin Industries at East Alton, Ill.

WILLIAM O'NEIL, president of the General Tire & Rubber Co., has been elected a director of Brand Names Foundation, Inc., New York 19, N. Y.

P. S. GOULD, manager of the Standard Practice Department of the Goodyear Tire & Rubber Co., has been elected to the board of directors of the Cleveland Chapter of the Society for the Advancement of Management.

D. M. HASTINGS, formerly vice-president and managing director of Goodyear-Argentina, has been appointed manager of the Western Hemisphere Divisions of the Goodyear Tire & Rubber Co.

DONALD V. BRANDON, manager of the rubber department and vice-president of Stein, Hall & Co., Inc., New York 17, N. Y., has resigned from the company.

R. S. WILSON, vice-president of the Goodyear Tire & Rubber Co., has been appointed to serve on the National Inter-Industry Highway Safety Committee.

GEORGE F. STAFFORD has been appointed manager of the Hard Rubber Division of Stowe-Woodward, Inc. At the same time, H. B. SHEPARD, vice-president of the company, resigned his position for reasons of health. He will, however, continue in an advisory capacity.

PHILIP R. ELMER, associated with the National Credit Office since 1923, has been elected a vice-president of the organization.

PAUL CODMAN CABOT, president of the State Street Investment Corp., Boston, Mass., has been elected a director of the B. F. Goodrich Co.

E. D. POWERS, formerly production manager of the American Cyanamid Co., has been elected a vice-president of the company in general charge of all matters concerning plant operations.

EUGENE, L. WYMAN, previously associated with the United States Leather Co., has joined the Goodyear Tire & Rubber Co. as Neolite Insole representative. He will service shoe manufacturers in the East from headquarters in Boston, Mass.

DR. GEORGE L. ROYER, assistant director of application research of the Calco Chemical Division of the American Cyanamid Co., has been eleceted chairman of the North Jersey Section of the American Chemical Society.

GEORGE GOODRIDGE, with offices at 175 Fifth Avenue, New York 10, N. Y., has been appointed a representative of the Durethene Corp. of Chicago, Ill., for the greater New York and New Jersey areas.

W. R. LANTZ, purchasing agent of the Sun Rubber Co., has been elected vice-president of the Purchasing Agents Association of Akron, Ohio.

HENRY THOURON, for the past year on special assignment in The Hague, Holland, for the Hercules Powder Co., has been named director of sales of the synthetics department.

J. J. COSTELLO, president of Tanney-Costello, Inc., has been appointed to the Membership Admittance Committee of the National Association of Waste Material Dealers, Inc., representing the Scrap Rubber Institute.

C. D. COUCH, national sales manager of the Pantasote Co., has been elected a vice-president of the company.

JOHN A. LUNN, who recently resigned as vice-president of the Dewey & Almy Chemical Co., will join the Kendall Co., Boston, Mass., as vice-president and director of manufacturing on September 1.

A. JEFFERSON DILLARD has been named vice-president of Deering, Milliken & Co., Inc., in charge of sales of the Rayon Tire Cord and Woven Plastics Divisions.

HENRY E. HEILMAN, formerly operations manager of the International B. F. Goodrich Co., a division of the B. F. Goodrich Co., has been named vice-president in charge of sales of the division.

J. O. COLE has been named vice-president of the Dayton Rubber Co., Dayton, Ohio.

WALTER E. SHIVELY, manager of tire design for the Goodyear Tire & Rubber Co., was recently honored with a pearl service pin marking 35 years of continuous service with the company.

FREDERICK C. KING, formerly associated with Burlington Mills, has been appointed technical representative of the Synthetic Fibers Department of the Carbide and Carbon Chemicals Division, Union Carbide and Carbon Corp.

THOMAS H. YOUNG, director of advertising for the U. S. Rubber Co., and coordinator of the savings bond campaign of the Advertising Council has been given a distinguished service award by the United States Treasury Department for his work on the Savings Bonds Campaign.

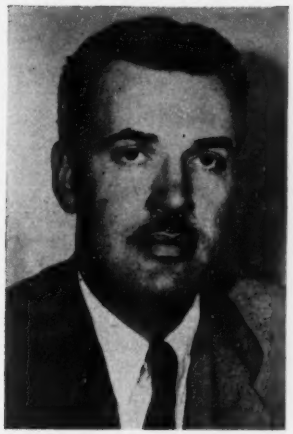
JOHN R. WATKINS, associated with the B. F. Goodrich Co. since 1946, has been named operations manager of the International B. F. Goodrich Co., a division of the parent corporation.

HAROLD J. HENRY, formerly president and general manager of Tek Hughes, Inc., a subsidiary of Johnson & Johnson, has been elected vice-president in charge of sales of the Commercial Solvents Corp.

ELLIOTT R. MCKEE, associated with the B. F. Goodrich Co. for the past 22 years, has been named managing director of the N. V. Nederlandse B. F. Goodrich Co., with headquarters in The Hague, Holland.

FRANK GRUCELLA, associated with the General Tire Co. for the past 17 years, has been appointed to serve with R. E. Huber, Ltd., Zurich, Switzerland, in a technical capacity. General Tire has a technical affiliation with the Swiss company.

## Sperberg Joins Huber Corp.



Lawrence R. Sperberg

Lawrence R. Sperberg, formerly associated with the Phillips Petroleum Co., has joined the J. M. Huber Corp. as chief chemist of the Carbon Black Division in Borger, Texas. In 1940, as manager of the Rubber Evaluation and Testing Sections of Phillips' Chemical Division, he established a rubber laboratory for the commercial development of furnace blacks. He developed new physical and chemical methods of testing carbon blacks, road test evaluations of tires, and aided in the development of the original cold rubber. Prior to joining Phillips, Mr. Sperberg was associated with the Research Department of the Goodyear Tire & Rubber Co. and with the Minnesota Mining and Manufacturing Co. Since 1947, he has been chairman of the Abrasion Testing Subcommittee of the Classification and Specifications of Rubber Compounds Section of the SAE-ASTM Joint Committee on Automotive Rubber. Mr. Sperberg is well-known as the author and co-author of numerous papers which have appeared in technical journals on the various aspects of rubber fabrication. He has addressed many technical groups and meetings on carbon black and cold rubber problems and has been issued several patents, with others pending, relating to rubber technology. Mr. Sperberg is a graduate of the University of Michigan where he received his degree in chemistry. He was a Goodyear Fellow from 1935 to 1936 at the University of Akron.

## Aero-Sealz Surfacing Material

Aero-Sealz, a new surfacing material that promises to protect airfield runways from the damaging effects of fuel spilled by jet planes, has been developed by the U. S. Rubber Co. It is a solvent resistant rubber compound which when mixed with tar produces a tough, durable surface that resists the dissolving effects of kerosene type fuel used by jet planes. Aero-Sealz is also said to show promise as a filler to seal joints between concrete slabs in highways and runways.

## Merac Liquid Accelerator

Sharples Chemicals, Inc., has announced the availability of a new liquid accelerator for use in latex formulations. The new accelerator will be marketed under the trademark "Merac." It can be employed in natural and synthetic latices. It is said to give excellent results in natural rubber or GR-S latex compounds cured over a range extending from room temperature to practical latex curing temperatures. Films vulcanized with this accelerator are reported to be characterized by high tensile strength and excellent aging properties.

Since Merac is a liquid miscible with water, it can be added directly to the latex. When diluted, it has a low viscosity which affords easy and rapid addition to the latex with a minimum of mixing to obtain a uniform formulation. The use of Merac eliminates the necessity of dispersing dry accelerators prior to addition to the latex. Order of addition of Merac to the latex is not critical, provided it is not added with the zinc oxide dispersion. It may be added alone or with other latex compounding ingredients, as long as it is not combined with the zinc oxide prior to addition to the latex.

Natural latex formulations accelerated with Merac have good stability and show a minimum change in viscosity on storage. The manufacturer states that Merac offers the following advantages: (1) It is a liquid accelerator which upon dilution with water is added directly to latex; (2) It is faster curing at room and elevated curing temperatures than most accelerators; (3) It imparts high modulus and tensile strength with flat curing and good aging characteristics, and (4) Its use provides compounded latex formulations which are stable on storage, exhibiting only moderate changes in viscosity.

The physical properties of Merac are: color and physical state—deep red to brown liquid; odor—characteristic; specific gravity—1.034 @ 20° C.; solubility—miscible with water, soluble in alcohol. Samples and technical information are available from Sharples Chemicals, Inc., 123 South Broad Street, Philadelphia 9, Penna.

## Billion Dollar Damage Suit

In a suit filed in Federal Court in Chicago, Ill., on June 13, Harris H. Horner, mechanical engineer of that city, sought $1,000,000,000 in damages from nine rubber and canvas companies. Mr. Horner says the firms capitalized on what he contends was his idea for wartime weapons and devices. He claims these firms made "millions" by making illusionary or "dummy" weapons during the war for the Armed Forces, and entered into a civil conspiracy to cause him "great damage" by depriving him of royalties. A previous suit entered by Mr. Horner in the United States Court of Claims in Washington, D. C., was turned down by the court. At that time, the Supreme Court refused to intervene. In the suit filed in the Federal Court at Chicago, Mr. Horner named the following as defendants: Firestone, Goodrich, General Tire, Goodyear, U. S. Rubber, Dunlop, Boyd and Gould Awning Co., General Outdoor Advertising Co., and the Scranton Lace Co.

## Behney Joins Harwick Standard

Dale F. Behney

Dale F. Behney, formerly associated with the Goodyear Tire and Rubber Co., has been appointed to the technical and administrative staff of the Harwick Standard Chemical Co. in Akron, Ohio. Mr. Behney will serve with the Akron staff in both a liaison and technical capacity. He was graduated with a degree in chemical engineering from North Carolina State College of Agriculture and Engineering in 1935 and joined Goodyear. With Goodyear, he served in development, tire design and technical service until 1939. In 1940, he was made a supervisor of Banbury training and, later, compounder for Airfoam development. In 1941, Mr. Behney was advanced to purchasing equipment for the Defense Plant Corp., and was purchasing agent for the Goodyear Synthetic Rubber Corp., and later served as chemical buyer for the Chemical Division. Mr. Behney is a member of the American Chemical Society. He was membership chairman of the Akron Rubber Group in 1948-1949 and was elected secretary-treasurer of the group for the 1949-1950 term. At the present time, Mr. Behney is vice-chairman-elect of the group.

## Additional Rubber Paving Tests

Rubber paving surfaces will receive their most severe test in a stretch of experimental roadway laid on June 18 on the West Side Highway near 12th Street in New York City. More than 60,000 cars will drive over this section of rubber roadway every day. The paving was laid by Manhattan's road bureau with technical assistance from the National Rubber Bureau and the Firestone Tire & Rubber Co. Four separate 100 foot sections were laid, one asphalt control and the others consisting of mixtures of asphalt with natural, synthetic and reclaimed rubber. The synthetic was furnished by Goodyear and the reclaim by Firestone. An experimental rubber road was also recently laid near Des Moines, Iowa, in an area where most of the traffic will be heavy trucks and trailers.

# NEWS IN BRIEF

U. S. Rubber has awarded special trophies for "most improved performance during the 1949-1950 season" to members of Fordham University's varsity basketball team. The company plans to give the awards each year to the college basketball team that shows the greatest improvement in play during the season.

Pretty Products, Inc., Coshocton, Ohio, has opened a New York sales office in the Empire State Building.

The manner in which Cordura rayon contributes to savings in industrial, manufacturing, and maintenance costs, is described in a new booklet issued by the Rayon Division of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del.

Overseas Engineering Co. of London, England, has developed the Mopal Compressor Kit which will keep a punctured tire pumped up while the car is actually being driven. An ingenious air-tight universal joint clipped to the wheel hub allows the tire to be blown up while the car is running. The car engine's fan belt drives the compressor.

What is said to be the largest and most powerful commercially available particle accelerator, a 100,000,000 electron volt General Electric betatron, has been installed at the University of Chicago. The unit will be used for nuclear research.

The principal thermodynamic properties of chloriné are presented in convenient graph form in a new publication of the Diamond Alkali Co., Cleveland, Ohio, entitled "Enthalpy-Temperature Diagram for Chlorine." Copies of the diagram are available on request to the company.

Morningstar, Nicol, Inc., 630 West 51st St., New York 19, N. Y., has devised a new data sheet which simplifies the recording of necessary information for proper analysis of dextrine and starch product problems. Copies of the data sheet, "Dextrine and Starch Product Operation Data Sheet," are available on request to the company.

Distribution of the first m.., ever published showing the location of colleges and universities throughout the country was recently begun by the General Aniline and Film Corp., 230 Park Avenue, New York, N. Y. The map gives the location of 240 institutions in the United States from which company employees received degrees. In addition, 45 foreign universities are also listed.

Arabol Manufacturing Co., has opened a new adhesives factory at 225 Moore St., S. E., Atlanta, Ga. The new plant will service customers in southeastern states.

Blackmer Pump Co., Grand Rapids, Mich., has issued a 6-page, 2-color bulletin illustrating the design, construction, maintenance, operation and application of rotary pumps. Details of sliding vanes and swinging vanes with selection table for specifying are included.

A technical bulletin on Statex R, reviewing a complete factory cycle from mixing to road testing and giving a comparison of Statex R to an average HAF black in an LTP tread, has been issued by Binney & Smith. Ask for Bulletin No. 154.

A new safetygraph, showing why falls are one of the most serious of all industrial accident hazards, how they occur, and how to prevent them, has been prepared by the National Safety Council. It is designed as a visual aid for training small groups.

"Desirability of Mixing Hi-Sil Compounds in the Banbury," is the title of a new pigment data bulletin issued by the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh 13, Penna. Ask for Bulletin No. 50-4.

Specifications for a number of automotive rubber products used by the Engineering Division of the Chrysler Corp., have been made available by the Rubber Chemicals Division of E. I. du Pont de Nemours & Co., Inc., Wilmington 98, Del. Ask for Spec. No. MS-BE 52.

Application of Iceberg Pigment and Imperial Whiting in low moisture absorption on GR-S compounds is covered in the March, 1950, issue of the *Burgess Pigment Standard*, house organ of the Burgess Pigment Co., Paterson 1, N. J. Copies are available on request to the company.

A special citation has been awarded to Goodyear by the Peabody Awards Committee for "The Greatest Story Ever Told," the company's radio program. Some 15 awards have been earned by the program since its inception four years ago.

The factory at Clinton, Ill., formerly operated by the Goodyear Footwear Corporation, was recently sold to Revere Copper & Brass, Inc.

Production of polyethylene by the Bakelite Corporation has increased from 15,000,000 to 50,000,000 pounds in the past year. Still further expanded production is foreseen in the near future.

Parker Appliance Co., Cleveland, recently produced one of the largest continuous section O-rings ever made. The huge ring, with a circumference of more than 12 feet, was made for a fuel tank sealing application.

The 1950 edition of "Studies in Centralized Lubrication" has been issued by the Farval Corp., Cleveland. As in previous editions, typical case studies are presented indicating economies effected in industrial operations through the installation of the Farval system of lubrication.

"Toxicology" is the title of a new 8-page booklet issued by Foster D. Snell, Inc. The booklet describes a service that has grown up with the Snell organization in the last three decades. Copies are available on request to the company.

A floor tile estimator is now being distributed to the trade by the American Tile & Rubber Co., Trenton. The calculator, which consists of a chart similar to a slide rule, is said to make possible more accurate determination of flooring requirements. The company recently added a new shade—Pearl Gray—to its line of colors.

Dunlop Rubber is planning a factory for the concentration of latex and bulk storage installations for the port of Colombo in Ceylon. Present plans call for handling approximately 200,000 gallons of latex monthly.

"Wright Rubber Floors," is the title of a new booklet published by the Wright Manufacturing Co., P. O. Box 6567, Houston, Texas. Any flooring dealer may secure a copy of this booklet which lists many hundreds of representative installations of Wright Rubber Tile by writing the company on his own letterhead.

The Mechanical Goods Development Department of the Goodyear Tire and Rubber Co. has announced the addition of a special mildew inhibiting agent to the materials used in the production of V-belts.

U. S. Rubber has appointed the F. D. Haker Co. of Milwaukee, as its distributor for its complete line of industrial rubber products in southern Wisconsin.

Glyco Products has announced that Paraspred, described as an efficient spreading agent for paraffin and microcrystalline waxes, is now in full production. In addition to its spreading properties, the material is said to plasticize paraffin wax improving its adhesiveness.

A new dry cleaning press cover fabric, called Asbestall, which is said to reduce the shine on men's suits caused by repeated pressings, is now being produced by U. S. Rubber. Press covers made of Asbestall are said to be of particular value for use with the new foam rubber pads now widely used by dry cleaners.

Decals are being placed on the fenders of all cars and trucks operated by the Sordoni Construction Co., of Forty Fort, Penna., to indicate the correct tire pressure of the particular vehicle. The decals were created by Palm, Fechteler & Co.

### Eide Elected Vice-President

Alwin C. Eide

Alwin C. Eide, associated with the American Zinc, Lead & Smelting Co. since 1916, was recently elected a vice-president of the company. Mr. Eide joined the American Zinc organization as a chemist at Hillsboro, Ill., in 1916. In 1919 he was made branch manager of the Chicago sales office, and in 1923 went to Columbus, Ohio, as sales engineer of the American Zinc Oxide Co., a wholly-owned subsidiary. He was named manager of the Pigment Division of the company in 1940, which included management of the company's plant at Hillsboro as well as Columbus. Mr. Eide was elected vice-president of the American Zinc Oxide Co. and the American Zinc Sales Co. in 1944. He is a recognized authority on zinc oxide and its uses in rubber and paint. Mr. Eide is also the author or co-author of several technical articles and papers on zinc oxide. He is a member of the American Chemical Society, American Ceramic Society, American Society for Testing Materials, the Akron Rubber Group, and other organizations. Mr. Eide is a graduate of the University of Illinois.

### Establishes Westendorf Scholarship

A. Joseph F. Westendorf memorial scholarship of an undisclosed amount, commemorating the memory of the former president of the Premier Rubber Manufacturing Co., has been established at the University of Dayton in Dayton, Ohio. The fund was set up by the directors of the rubber company. The late Mr. Westendorf was a member of the associate board of lay trustees at the University.

### C. P. Hall Plant Opens Soon

The new plant constructed by the C. P. Hall Co. at Bay Avenue and Wheeler Point Rd. in Newark, N. J., is scheduled to open August 1 for service to Eastern rubber manufacturers. The Newark expansion marks the company's thirty-first year of service to the rubber industry, and will enable C. P. Hall to render better and faster service to manufacturers.

### Cancel Federal Leather Deal

Despite reports to the contrary, the assets of the Federal Leather Co., Belleville, N. J., will not be sold to National Automotive Fibres, Inc., of Detroit, Mich., according to Louis Plansoen, president of Federal Leather. Negotiations for the sale have been conducted for some time and in fact National Automotive Fibres had actually filed a statement with the Securities and Exchange Commission for the issuance of 150,000 additional shares of capital stock, the proceeds of which were to be used to finance acquisition of the Federal Leather assets. Negotiations for the acquisition were cancelled by mutual consesnt of both companies. According to Mr. Plansoen, Federal Leather will continue under its present management and no changes of any kind are contemplated. The company will complete its current expansion program within the next few months as planned. Business is reported as satisfactory with a backlog of orders on hand. National Automotive Fibres has cancelled its proposed stock offering.

### Footwear Industry Group Meets

The newly organized Leather and Footwear Industry Group of the Quartermaster Association met with Quartermaster Corps industrial mobilization planners on June 8 at the New York Quartermaster Procurement Agency. A number of rubber footwear manufacturers were represented at the meeting, and V. N. Hastings, manager of the Production Division and Control of the U. S. Rubber Co. at Naugatuck, Conn., was appointed temporary chairman of the Rubber Footwear Committee, subject to future election. Following a discussion of the over-all program for Quartermaster Association-Army-Industry cooperation, the group joined in an open discussion of industrial mobilization planning activities. The Footwear and Leather Industry Group is expected to aid the Research and Development Branch of the Office of the Quartermaster General in advising on the development of new items, and the improvement of certain characteristics of items now in use.

### New Vinylite Dispersion Plant

Plans have been completed for the construction of a new plant at Charleston, W. Va., for the production of Vinylite dispersion resin VYNV.3, product of the Bakelite Division of Union Carbide & Carbon Corp. The new plant, to be built and operated by the Carbide & Carbon Chemicals Division, is scheduled to be in operation by mid-1951. Vinylite dispersion VYNV.3 is used in the production of such products as dolls, children's and ladies' overshoes, draperies, intricately-shaped elastomeric or flexible industrial parts, low-cost flooring, electrical wire insulation, upholstery fabrics, etc. The new material has been in pilot plant production for about two years and is said to combine advantages of greater ease and speed in compounding, fabricating and finishing operations, such as impregnating, dip-coating, and slush-molding.

### McKay Joins Ames Rubber

E. T. McKay

E. T. McKay, formerly associated with the Manhattan Rubber Division of Raybestos, Manhattan, Inc., has joined the Ames Rubber Corporation, Hamburg, N. J., as vice-president and sales manager. He was with Manhattan Rubber for the past 19 years and was in charge of the typewriter and business machine rubber department. At the same time it was announced that at a recent meeting of the board of directors of Ames Rubber, J. H. White, Jr., formerly executive vice-president, was named president of the company, and L. Edland, formerly vice-president, was appointed executive vice-president. It was also announced that Richard Glidden, formerly with the Rodic Rubber Corp., has joined the company as chief chemist. Ames Rubber is now in its second year of operation and is reported to have made good progress.

### Rempel Opens Canadian Plant

The opening of the plant of Rempel Manufacturing Canada, Ltd., in Toronto, Ont., Canada, was recently announced. The new plant occupies 12,000 square feet of floor space and is a wholly-owned subsidiary of Rempel Manufacturing, Inc., of Akron, Ohio. D. G. Rempel, president of the parent concern, is president and chairman of the board of the Canadian operation; W. A. Willson, of Toronto, is vice-president and general manager, and C. A. Thomlson, a Canadian lawyer, is secretary. Installation of machinery at the plant was in charge of David Kempthorne, maintenance engineer of the parent firm. Organized three months ago, the Canadian plant is scheduled to begin operations by mid-summer. The Canadian firm is under contract to use the roto cast process, developed and patented by Mr. Rempel. The plant will make the same line of rubber animal toys that are produced by Rempel Manufacturing in Akron. A Mexican affiliate, of which Rempel owns 40% of the common stock, is in the process of organization. The Mexican firm will also make the Rempel line of toys from the roto cast process.

### Field Addresses Thiokol Club

An interesting talk on the "Development and Application of Vinyl Resins" was given by George E. Field, technical service manager of the B. F. Goodrich Chemical Co., before the Thiokol Technical Club at the plant of the Thiokol Corporation in Trenton, N. J., on June 27. Introduced by B. S. Garvey, of Sharples Chemicals Inc., Mr. Field first discussed the wide range of vinyl materials commercially available and some of their more important properties, and then outlined the theory of vinyl breakdown. He compared the properties of rubber and vinyls and said that the higher price of the vinyls was offset by the speed and ease of processing. In this connection he pointed out that approximately 25% of all garden hose is now made from vinyl resins while between 60 and 70% of all building wire is now vinyl insulated. With regard to vinyl films, Mr. Field stated that widths as wide as 72 inches are being produced at the rate of 100 yards a minute. The speaker also covered plastisols and organosols in his talk, as well as some of the newer vinyl latices which are finding favor in the paper and boxboard fields. A spirited question-and-answer period followed the talk.

### Geon Vinyl Insulating Compound

A new vinyl insulating compound, especially designed for high temperature service (105° C. maximum), is being used to protect iron constantan and copper constantan thermocouple lead wires manufactured by the Thermo Electric Co., Inc., Fairlawn, N. J. Made from Geon, a product of the B. F. Goodrich Chemical Co., the insulation is said to be greatly improved and more durable than the conventional rubber covering used heretofore. Features of the Geon compound, known as Geon Plastic 8630, which make it satisfactory as insulation material include its excellent resistance to high temperature aging, good abrasion and deformation resistance, good flexibility at both high and low temperatures, and smooth, glossy surface which make for ease of handling and attractive appearance. The compound has been found to be non-corrosive toward copper, and its high dielectric strength permits thinner insulation walls than are possible with other insulating materials. The new insulating compound has also demonstrated excellent low temperature characteristics in sub-zero operations.

### Somerville Addresses Chemists

Dr. A. A. Somerville, of the R. T. Vanderbilt Co., was one of the principal speakers at the 27th Annual Meeting of the American Institute of Chemists, held in New York City on May 11 and 12. He presented a paper on "Chemicals Used in the Manufacture of Rubber Goods." The paper was of general elementary nature and traced the formulation of a rubber compound by the addition of the various materials, such as sulfur, softeners, antioxidants, fillers, etc., with a brief explanation given of the purpose of each material.

## FINANCIAL NEWS

### Firestone Tire & Rubber Co.

Six Months Ended April 30: Net profit of $13,320,055, after provision of $2,500,000 to cover earnings of certain foreign subsidiaries, which is equal to $6.68 a share on the outstanding common stock, and which compares with $8,149,907, after provision of $2,000,000, or $4.02 a common share for the six months ended April 30, 1949.

### Dayton Rubber Co.

Six Months Ended April 30: Net profit of $479,363, which is equal to 95 cents a common share and which compares with $69,256, or 5 cents a common share, for the corresponding period a year ago. Net sales for the period ended April 30, 1950, totaled $12,700,420, against $11,695,048 for the six months ending April 30, 1949.

### Armstrong Rubber Co.

Twenty-Five Weeks to March 26: Net income of $351,543, which is equal to 82 cents each on 313,192 combined shares of Class A and 53,380 shares of Class B common stock. Net sales of the company during the period amounted to $14,488,869. No comparison is available with the corresponding period in the previous year.

### United Shoe Machinery Corp.

Year Ended February 28; Net income of $6,292,224, which is equal to $2.55 per share of common stock, compared with $7,021,871, or $3.15 per share of common stock, in the 1949 fiscal year.

### Philadelphia Insulated Wire Co.

For 1949: Net loss of $96,709, compared with a net loss of $45,995 the year before. Net sales for 1949 totaled $1,431,199, against $2,058,042 the year before.

### O'Sullivan Rubber Corp.

First Quarter: Net income of $39,000 equal to 8 cents a common share, which compares with a revised loss of $4,087 reported for last year.

### Malm Named Liaison Officer

Frank Malm, who retired last month after more than 44 years of continuous service with the Bell Telephone Laboratories, has been named liaison officer in the United States for the Telegraph Construction & Maintenance Co. and Submarine Cables, Ltd., both of London, England. He will assist Submarine Cables, Ltd., in connection with its exhibit at the Chicago Industrial Exhibition, at which the products of more than 40 countries will be displayed. Mr. Malm makes his headquarters at his home, 931 Ridgewood Road, Millburn, N. J.

### Greater Productivity Urged

American industry will have to invest up $200,000,000,000 during the next ten years if the United States is to achieve the productivity needed to maintain its high standard of living, said John L. Collyer, president and chairman of the B. F. Goodrich Co., at the Golden Anniversary celebration of the Automobile Club of Buffalo, N. Y., on June 24. Mr. Collyer said that "only by increasing productivity per worker by 30 to 35% during the next ten years will it be possible to maintain the greater population at a standard of living equal to or better than today's level." In his remarks, entitled "Buffalo's Message for Progress," Mr. Collyer made three recommendations as to the administration of the government synthetic rubber program. He called for the maximum production of synthetic in all government plants now in operation, and the re-opening of at least one more synthetic plant. He also recommended a re-examination of the plans for re-opening inactive plants to make certain that additional supplies of rubber can be made available in a minimum of time.

### Kahn Acquires Norwalk Tire

Albert M. Kahn, of New York City, president of Consolidated Products Co. and of Acme-Hamilton, Inc., has acquired the Norwalk Tire & Rubber Co., of Norwalk, Conn. Mr. Kahn, who stated that he bought the plant as an individual, tendered a bid of $2,600,000 on June 6 to the United States District Court just as the court was about to confirm the bid of $2,500,000 previously submitted by the Aetna Industrial Corp. of New York City. Because of the unexpectedness of the Kahn bid, the court postponed a decision for two days to allow Aetna officials an opportunity to discuss increasing their own bid. Since no additional bid was forthcoming, the court approved Mr. Kahn's bid on June 8. Trustees of Norwalk Tire had prepared a plan of payment to creditors based on the Aetna bid. Basing payments on the Kahn bid meant an increase to creditors of about 3%. Norwalk Tire has approximately $1,709,000 in unsecured debts.

### Scrap Freight Reduction Approved

The proposal of the Scrap Rubber Institute of the National Association of Waste Material Dealers, Inc., to lower freight rates for scrap rubber in carload lots has been approved by the General Freight Traffic Committee of the Eastern Railroads, according to word received by N.A.W.M.D. headquarters. The proposed reduction is believed to be in the neighborhood of about 15% or savings of approximately $1.50 per ton. Members of the Scrap Rubber Committee's Traffic Committee, which prepared the plea, included the following: L. N. Larsen (Muehlstein), Roger Ottignon (Berzen), G. S. Geiger (Schulman), and E. W. Kneesy (Muehlstein). The presentation before the railroad committee was made in Chicago on June 12 by Messrs. Geiger and Kneesy.

## Heads A. Schrader's Son, Inc.

Selden T. Williams

Selden T. Williams, vice-president of the Scovill Manufacturing Co., and general manager of its A. Schrader's Son Division, has been elected president of A. Schrader's Son, Inc. Mr. Williams joined A. Schrader's Son, Inc., in 1929 and was appointed vice-president of Scovill in charge of manufacturing of Schrader domestic and foreign plants in November, 1944. He received his B.S. degree from St. Lawrence University in 1913 and earned his master's degree there in 1926. He also received a B.S. degree in mechanical engineering from Worcester Polytechnic Institute in 1916. After graduation from Worcester Polytechnic, Mr. Williams became technical editor of *Class Journal*. In 1917 he joined the Naval Aircraft Factory in Philadelphia, Penna., as assistant experimental engineer, later becoming assistant chief engineer. In 1922 he became associated with the Victor Talking Machine Co. of Camden, N. J., where he worked up from assistant chief draftsman to general superintendent and works manager in 1927. He left Victor in 1929 to join Schrader. Mr. Williams holds patents on many industrial inventions, several of them in widespread use. He is also the author of the "Automobile Repairman's Helper" and many technical articles. He is a member of many technical and fraternal organizations.

## GamaCo Calcium Carbonate

The Calcium Products Division of the Georgia Marble Co., Tate, Ga., has announced the availability of GamaCo, a high-grade calcium carbonate made from selected crystalline marble which may be used as an extender or as a filler. Because of its low top particle size, GamaCo is said to give unusual performance as to extrusion rate, flex resistance, and abrasion resistance. In comparison with other similar pigments it will show moderate increases in modulus and tensile strength. These tendencies are due in part to its straight line distribution, and the absence of an excess of extreme fines. GamaCo disperses relatively quickly and thoroughly.

## LABOR NOTES

A five-year company-financed pension agreement between the General Tire & Rubber Co. and the U.R.W.A. was announced on June 6. It provides for retirement at age 65 of employees of 25 years of service at $100 a month including social security benefits. The agreement covers the Akron and Waco plants.

A group of some 500 engineering and maintenance workers in the Akron area believe their wages suffer by comparison with those of certain other fellow workers and have asked the international rubber union to call a special session of its policy committee to consider the situation. The group claims inequalities exist, for example between their fixed wages and those of production workers on piece rates.

Two labor disputes which have prevailed at Fremont, Ohio, since last March were settled on June 6 when AFL unions at both the Fremont Rubber Co. and the Crown Rubber Co. accepted new two-year contracts. No pay increases were involved, other than for overtime and holiday work.

In the future the salary of I. H. Watson, president of Firestone Local 7 of the U.R.W.A., will be paid by the John Hancock Mutual Life Insurance Co. While continuing as president of the local, Mr. Watson will administer the group insurance program which the local negotiated with the insurance company recently.

A new pension plan for the U. S. Rubber Co. was approved by stockholders at a special meeting on June 27. The plan guarantees at least $100 a month, including social security, to employees retiring at 65 after 25 or more years of service and also provides a payment of at least $60 a month to any employee premanently disabled after 20 years of service.

A recent election conducted by the National Labor Relations Board resulted in the selection of the U.R.W.A. as sole bargaining agent for the workers of the Sweet Rubber Co. in Akron. The vote was 21 for the union and 18 against. It was the fifth representation election won by the U. R. W. A. this year.

A fully funded, company-financed pension, insurance and welfare program has been negotiated between the Midwest Rubber Reclaiming Co. and the U.R.W.A. A joint statement issued by the locals at the company's Barberton and East St. Louis plants indicated the benefits give Midwest employees "the finest program in the industry."

A four-day wildcat strike hit the plant of the Mohawk Rubber Co. in Akron, with workers returning to full production on June 27. The dispute was over piecework rates in the band room, where women are largely employed, and started as a sit-down. Company officials said the strike came as a surprise, since negotiations have been in progress. The workers returned at the request of union leaders.

## Crossley Named Assistant Manager

Robert H. Crossley

Robert H. Crossley has been appointed assistant manager of zinc oxide sales for the St. Joseph Lead Co. He will continue to make his headquarters at the company's executive offices at 250 Park Ave., New York 17, N. Y. Mr. Crossley joined St Joe in 1948 as manager of technical service, zinc oxide department, after 14 years' experience in the fields of rubber technology and of sales and technical service of pigments and raw materials to the rubber, paint, ceramic and related industries. In addition to his new duties, he will continue to have charge of technical service on zinc oxide. A graduate in chemical engineering, Ohio State University, Mr. Crossley is a member of the American Chemical Society and the Divisions of Rubber Chemistry, Industrial & Engineering Chemistry, and Paint, Varnish and Plastics Chemistry. He is also a member of the Akron and New York Rubber Groups, and of the American Society for Testing Materials, serving on committees D-1 and D-11.

## Quaker Rubber Elects Officers

J. R. Keach, general manager of the Quaker Rubber Corp., Philadelphia, Penna., has been elected vice-president and a director of the company. G. C. Johnson, general sales manager of the company, was also elected a director. F. A. Rehorst was elected secretary and V. P. McNichol, assistant treasurer. T. M. Evans is president of the company. Quaker Rubber is a recently acquired division of H. K. Porter Inc., of Pittsburgh, Penna.

## Denies Tire Shortage Rumor

Existence of a tire shortage was firmly denied by the General Tire & Rubber Co. in newspaper advertisements carried from coast to coast on July 5. According to the advertisement, all tire manufacturers have plenty of tires to sell "despite false rumors in connection with the Korean war." It added that there is no reason for automobile owners to be stampeded into buying "through fear of rationing."

# CANADIAN NEWS

Control of one of Canada's oldest and famous industries, Gutta Percha Limited, has passed from members of a Toronto family—who have owned and directed the company since 1887—into the hands of M. O. Simpson, a Kansas-born Montreal industrialist and businessman.

Mr. Simpson, a former vice-president of the Dominion Rubber Co., Ltd., and head of Combined Enterprises, Ltd., has purchased all the shares of the Toronto concern. He becomes chairman of the board of directors and president with J. Ross Belton, who has been with Gutta Percha for the last 20 years, as vice-president and general manager. Charles S. Band, of Toronto, a son-in-law of the company's founder and previous board chairman, remains as a director.

Other directors under the new ownership are H. C. Walker, K. C., a Toronto barrister, Claude S. Richardson, a Montreal barrister, and M. O. Simpson, Jr. The secretary-treasurer is J. M. Allison.

Gutta Percha was started in Toronto by the late H. D. Warren, who died in 1909. Formerly with Gutta Percha in New York and the Otis Elevator Company in London, England, he was entrusted with the management of the rubber concern's factories when it set up a Canadian subsidiary in 1883. Four years later he acquired control and launched the company on a period of steady expansion. Before his death he also became a director of the Bell Telephone Co., the Canadian Bank of Commerce and the Montreal Wire and Cable Co.

Since Mr. Warren's death, Gutta Percha has been controlled by Mr. Band, and by two sons, H. D. Warren, and F. A. Warren, and the founder's widow, Mrs. H. D. Warren. Under their direction the company grew to become the largest all-Canadian rubber concern and a world-wide organization with a British subsidiary and agencies and offices in many foreign countries. It specialized in the manufacture of footwear, mechanical rubber products, and automobile accessories, and branched out into the manufacture of automobile tires. Recently it dropped out of the tire field but remains a strong competitor in its other lines.

---

Goodyear Tire and Rubber Co. of Canada, Ltd., has announced a million dollar expansion and improvement program at its New Toronto plant. The new addition will enable the company to increase its production of Airfoam and will require approximately 110 additional employes.

A. W. Denny, vice-president in charge of production, made the announcement. He said the program was expected to be completed by late summer and production started in the new extension by end of the year. With the new additions, adding 27,100 square feet, the company's floor space will occupy approximately 21 acres.

Improvement to the present plant includes new boilers for the power house. It will enable the company to take care of the expansion and to have some reserve in case of breakdown or increase in production.

The new addition will have a ground floor plant 40 feet wide and 240 feet long. A second story will reach approximately half-way down the building. Total floor space will be 19,600 square feet. Expansion in the power house will produce approximately 100,000 pounds of steam per hour at 655 pounds pressure, 750 degrees temperature.

The building to house the extension will be of two-story construction, 44 feet wide and 98 feet long. Total floor space will be 7,500 square feet.

---

William E. Ireland, since December 1, 1949, Vice President-Sales of the International B. F. Goodrich Company, has been named Vice President-General Manager of the Tire Sales Division of the B. F. Goodrich Company of Canada, Ltd., Kitchener, Ontario, it has been announced by George W. Sawin, president of the Canadian Company. Mr. Ireland has been with Goodrich for 16 years and had been merchandise manager of International B. F. Goodrich for two years before becoming vice-president of that division.

A graduate of Ohio Wesleyan University, Mr. Ireland has held various sales posts. He was in the company's Automotive, Aviation and Government sales division in Washington, D. C., during the war period. He was loaned to the U. S. Government War Production Board as a "dollar a year man" as chief of that agency's tire and tube production division returning to Goodrich in 1945 as manager of replacement passenger tire sales before joining the foreign trade division of the company.

---

Consumption of rubber in Canada fell 10% in April to 13,842,200 pounds, according to the Bureau of Statistics. March consumption amounted to 15,086,200 pounds. During April, Canadian rubber plants consumed 7,790,000 pounds of natural rubber, 3,678,100 pounds of synthetic rubber, and 2,374,100 pounds of reclaimed rubber. Domestic production of synthetic rubber during the month amounted to 10,313,000 pounds, as compared with 11,849,600 pounds in March.

---

The appointment of W. Hannah as manager of the Ontario Branch of the Dunlop Tire & Rubber Goods Co., Ltd., has been announced by H. S. Pritchard, general sales manager. Mr. Hannah has served the company for over 20 years in various sales capacities and until recently was in charge of the bus-truck and farm tire sales division.

---

A net profit of $177,340, equal to $1.50 per share, for the fiscal year ended February 28 has been announced by the Viceroy Manufacturing Co., Ltd. This compares with $146,235, or $1.24 a share, for the previous fiscal year. Current assets at fiscal year-end amounted to $917,923 and current liabilities to $178,662.

---

The Dunlop Tire & Rubber Goods Co., Ltd., and its plants and office workers have subscribed $3,000 to the Manitoba Flood Relief Fund. A check for this amount has been forwarded to the Mayor of Winnipeg. The company matched the amount of $1,500 raised by the employees.

---

A general increase in tire prices, averaging 5% on passenger and farm tires and 5 to 7½% on truck and bus tires, went into effect in Canada last month. The initial increase was announced by Canadian Goodyear and was quickly followed by announcements of other companies. The increase was attributed to higher costs of raw materials, particularly natural rubber.

---

Full scale production of polyethylene film and tubing at the Shawinigan Falls plant of Canadian Industries, Ltd., was recently announced.

---

Tillotson Rubber, of St. John's, Quebec, manufacturers of rubber toys, balls, baby pants, etc., is considering plans for the early construction of a factory addition to provide about 75,000 additional square feet of manufacturing space.

### Styrene Monomer Prices Rise

Due to higher costs of benzol, a major producer has boosted prices on styrene monomer and polystyrene injection molding thermoplastic material. The advance in styrene amounting to approximately 1½ cents per pound establishes the price for tank cars at 16½ cents per pound. Carlot and less than carlot prices are 17¾ and 18¾ cents per pound, respectively. The price for clear polystyrene has been advanced from 25½ to 27 cents, and for colors from 30 cents to 31 cents a pound. The higher prices on styrene monomer were effective as of the date of the announcement, June 16, with contract customers coming under a July 1 deadline.

### Propose Okonite Stock Split

Directors of the Okonite Co., Passaic, N. J., at a recent meeting voted to recommend to stockholders a split of the company's present $100 par value shares into four shares of $25 par value each. A stockholders' meeting for such purpose will be held on July 25. If the plan is approved, the president will recommend to directors that a dividend in common stock of 25% be declared.

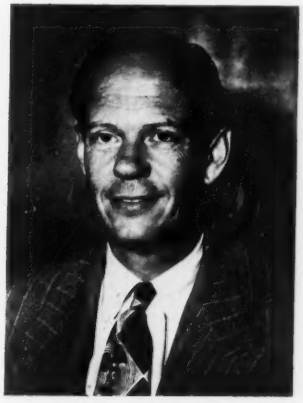
# LOS ANGELES NEWS

Approximately 200 members and guests attended the June 13 meeting of the Los Angeles Rubber Group held at the Mayfair Hotel in Los Angeles, Calif. The meeting was sponsored by the U. S. Rubber Co. In the absence of plant manager John M. Miller, R. E. Behrman acted as master of ceremonies. An interesting talk on big game hunting was given by Roy Weatherby, famous gun expert and well-known hunter. Following Mr. Weatherby's address, colored moving pictures of big game hunting in Africa were shown.

At the technical meeting preceding the regular dinner meeting, Dr. Frank M. McMillan of the Organic and Applications Department of the Shell Development Co., Emeryville, Calif., addressed the group on "Plasticizing Action vs. Composition for Hydrocarbon Plasticizers."

The speaker observed that the majority of the plasticizers used by the rubber industry are hydrocarbons and include such diverse types as light paraffinic oils, crystalline waxes, viscous aromatic liquids, and solid resins and asphalts. For purposes of general classification, the behavior of a given hydrocarbon type in rubber may be described as a function of two factors: the size of the molecule (molecular weight) and its degree of aromaticity or polarity.

The properties primarily dependent on the polarity of the plasticizer are compatibility, incorporation time, tack, and stickiness; those chiefly dependent on molecular weight are plasticity, hardness, tensile and tear strength, cut-growth resistance, resilience and hysteresis. The way in which the individual properties vary with increasing polarity and molecular weight was outlined by the speaker. He also illustrated the method of choosing a plasticizer for a particular application as a problem in selection between opposing effects to obtain optimum balance of properties.



**Alvin E. Hewitt**
*Elected Vice-President of Arrowhead Rubber*

---

The annual outing of the Los Angeles Rubber Group was held on June 17 and 18 at the Del Mar Hotel located approximately 25 miles from San Diego, Calif., on the South Coast of Southern California. Approximately 150 members and guests registered at the hotel to participate in the outing.

The two-day program was crowded with a sports schedule which included baseball, tennis, badminton, shuffleboard, horseshoes, golf, ocean and swimming pool contests, water polo, fishing, and other games. A cocktail hour and dinner were held on the evening of June 17 in the main dining room of the hotel. Suitable prizes for all occasions and events were won by many of the sports participants.

The 1950 outing was under the general chairmanship of Bob Abbott, who was assisted by George Steinbach, Charley Towers, Jack Merritt, and Herb Griley. Members who headed the various special committees included the following: *Tickets,* Deke Maddy; *Raffle,* Fred Thistle; *Housing and Transportation,* Carl Hoglund; *Golf,* Bob Bowen; *Outdoor Sports,* Chuck Findlay; *Water Sports,* Larry Snow and Bob Johnson; *Prizes,* Del Delguerra; *Publicity,* Bob Short; *Entertainment and Banquet,* Curt Wolter; *Indoor Activities and Sports,* Tommy Thompson; *Fishing,* Jack Knudsen; *First Aid,* C. M. Churchill.

---

Alvin E. Hewitt, assistant general manager of the Arrowhead Rubber Co. since January, 1949, has been elected a vice-president and a director of the company. Mr. Hewitt is widely known in industrial circles. Prior to the war, he was Pacific Coast manager of the National Association of Manufacturers. After release from the Air Corps, with the rank of colonel, he became executive vice-president of the California Manufacturers Association. Mr. Hewitt resigned from C.M.A. to accept a position in industry and shortly therefater joined the Arrowhead concern. He is 41 years old, married and lives in La Habra Heights.

---

The Sunland Latex Products Co. was recently organized at 2036 Broadway, Santa Monica, for the production of dolls, toys and other specialties from latex.

---

Miscellaneous mechanical goods will be made by a new company recently organized under the name of the Pacific File and Tool Co., at 1528 North Bonnie Beach Place in Los Angeles. Frank Spore is superintendent of the company's rubber division.

**F. A. Steele**
*Retires After 40 Years of Service.*

---

The Los Angeles Rubber Group in cooperation with the Southern California Section of the American Chemical Society presented a television program entitled "Rubber Chemists In Action" over station KTLA in Los Angeles on June 11. The entire show was conceived, managed and produced, as well as acted, by Phil Drew, George Miller, Elliott McLaughlin, Deke Maddy and Bart Thompson.

---

E. R. Evans, formerly associated with California Rubber Products, Inc., of Hawthorne, as sales manager, has become associated with the H. C. Lien Rubber Co.

---

Dwight Barger has resigned his position as purchasing agent of the Los Angeles plant of the U. S. Rubber Co. and plans to spend the next few months travelling.

---

Francis J. Keefe, owner of the Southwestern Rubber Co., Los Angeles 23, passed away on May 4. Mr. Keefe had been associated with the company he headed for many years and had long been a member of the Los Angeles Rubber Group.

---

As briefly reported elsewhere in this issue, Frank A. Steele, plant manager of the Los Angeles installation of the Goodyear Tire & Rubber Co., will retire on September 1, after forty years of service. Mr. Steele was born in Marshallville, Ohio, on May 10, 1884, and attended Wooster College and the Case School of Applied Science. Following a brief career as a schoolteacher, he joined Goodyear in June, 1910, at the Akron plant.

In 1919, Mr. Steele was transferred to the Los Angeles plant as a division superintendent. Ten years later, he was placed in charge of production at the company's new plant in Gadsden, Ala. His next move was to a similar assignment in the Goodyear plant in Wolverhampton, England. Mr. Steel terminated his service in the foreign operations in 1939, and returned to California as plant manager.

# OBITUARIES

### *Julius Muehlstein*

Julius Muehlstein, treasurer and a director of H. Muehlstein & Co., Inc., New York, N. Y., died on June 15 at Mt. Sinai Hospital in New York City after a lingering illness. He was 59 years old. Mr. Muehlstein entered the rubber business at an early age and later joined his brothers, Herman and Charles, in business. Upon the incorporation of H. Muehlstein & Co.,

Inc., Mr. Muehlstein became a director and treasurer of the company, positions he held at the time of his death. He was also a director of H. Muehlstein & Co. (London), Ltd., and director and treasurer of H. Muehlstein & Co. (Canada), Ltd. For a number of years he served as director and vice-president of the National Association of Waste Material Dealers, and had served as president of the Scrap Rubber Institute. Mr. Muehlstein was a member of the Metropolis Country Club, Inwood Country Club, and the City Athletic Club. He is survived by his wife and two brothers, Herman, chairman of the board of the company, and Charles, vice-president of the company, and two sisters.

### *Clarence S. Johnson*

Clarence S. Johnson, superintendent of the Hawthorne Works of the Western Electric Co. at Chicago, Ill., died on June 12 at the Commodore Hotel in New York City of a heart attack. Mr. Johnson, who was 46 years old, was visiting company headquarters in New York at the time of his death. He began his career with Western Electric in 1925, shortly after he was graduated from Rutgers University. His first position was purchasing investigator in New York and in subsequent years he rose to the post of purchasing agent for the company's Radio Division. In 1949, he was made superintendent of the Hawthorne Works. His wife and three children survive.

### *Winthrop W. Benner*

Winthrop Webster Benner, formerly executive vice-president of the Lee Tire & Rubber Co., Conshohocken, Penna., died on June 10, at his home in Arcola, a suburb of Philadelphia, Penna. He was 69 years old. Born in Minneapolis, Minn., Mr. Benner was graduated from the University of Minnesota. He was with the Firestone Tire & Rubber Co. in Akron as superintendent of production from 1915 to 1926. During World War II, Mr. Benner was president of the National Synthetic Rubber Co. Later, he joined Lee Tire, retiring in 1946 because of ill health. Mr. Benner was a member of the F. & A. M. Lodge in Port Arthur, Ont., Canada. Funeral services were held on June 14 in Norristown, Penna., with interment in Valley Forge Gardens in Norristown. Mr. Benner is survived by his wife and daughter.

### *G. E. F. Lundell*

Gustav E. F. Lundell, who retired as chief of the Division of Chemistry of the National Bureau of Standards several years ago, died on June 8 in Baltimore, Maryland, after an extended illness. Born in Brooklyn, N. Y., Dr. Lundell attended Cornell University, securing a doctorate in 1909. Before joining the Bureau of Standards in 1917 as a chemist he taught at both Cornell and Northwestern Universities. At the Bureau he specialized in metal and ore analysis and was named chief of the Division of Chemistry in 1937.

### *George T. Willson*

George T. Willson, a retired superintendent for the DeLaval Separator Co. at its factory in Poughkeepsie, N. Y., and one time director of development and research for the firm, died on June 16 at his home in that city. Mr. Willson, who retired two years ago, was born in Brooklyn and was graduated from Pratt Institute with a degree in electrical engineering. Before joining DeLaval, he was employed by the Mergenthaler Linotype Co. in Brooklyn. He was a Mason. His wife survives.

### *George W. Romell*

George W. Romell, purchasing agent of the Barr Rubber Products Co., Sandusky, Ohio, died on June 20, at the Good Samaritan Hospital in Sandusky. He was 52 years old. Born in Berlin Heights, Ohio, he was well-known in Akron rubber circles. Mr. Romell was a Mason, and belonged to the Grotto and the American Legion. Services were conducted on June 23 in Sandusky, with burial in Berlin Heights. He is survived by his widow, a son and a daughter.

### *Russell B. Koontz*

Russell B. Koontz, former president of the Adamson Machine Co. of Akron, Ohio, died on June 23 in St. Petersburg, Fla. Mr. Koontz, who was 77 years old, had been ill of a heart condition for several years. He was with the firm, which is now the Adamson-United Co., for 30 years, starting as a bookkeeper. Mr. Koontz was born near Greensburg, Ohio, and attended Buchtel College. He received a master of engineering degree in 1895 from Ada College, now Ohio Northern University. After graduation, he was hired by the B. F. Goodrich Co. as a salesman. Shortly thereafter, he was placed in charge of bicycle tire sales in New York City, and later in St. Louis. Mr Koontz joined Adamson in 1900. Ten years later he was named sales manager and secretary-treasurer of the company. He became president in 1928 upon the death of the firm's founder, Alexander Adamson. Mr. Koontz left Adamson in 1930 and went to Chicago 4 years later, joining the office supply firm of M. B. Cook & Co. in charge of credits. He retired in 1940. During the war he took a position in charge of machine tool liaison for the Goodyear Aircraft Corp. His health broke down in 1944 and he again retired, moving to Florida two years later. Mr. Koontz was a member of the F. & A. M. and the Exchange Club. He is survived by his widow, two sons and a daughter.

### *Raymond R. Hazen*

Raymond R. Hazen, former sales manager of the Oak Rubber Co., Ravenna, Ohio, died at his home in that city on June 6. He was 58 years old. Mr. Hazen was the first sales manager of the Oak company. He left that position in 1938 when he was appointed City Treasurer, a post he held until his death. Previously, he had been employed with the State Bank in Akron.

### Diox 7 Solution Available

Diox 7, *tert*-butylisopropylbenzene hydroperoxide, in a 50% solution with the parent hydrocarbon material is now available in semi-commercial quantities from the Research and Development Department of the Phillips Petroleum Co., Bartlesville, Okla. This new chemical has been effectively utilized as an oxidant or "initiator" to promote rapid emulsion polymerization of butadiene and styrene with redox and peroxamine recipes such as those employing ferrous pyrophosphate and polyamines. Diox 7 is said to be more active than other commercially available hydroperoxides used in rubber polymerization at low temperatures; consequently, less is required to initiate polymerization. Bulk polymerization of vinyl type monomers also is accelerated by Diox 7. The product in the pure state is a white crystalline compound. The 50% solution now being marketed is semi-solid at room temperature but completely liquid above 110°F. Both the hydroperoxide and the solvent have low volatility and the solution has a flash point of about 300° F.

THE STORY BEHIND THE WORD...

# SIRLOIN...

*Henry VIII, the English king, famous for his many wives was also quite a wit. One day in a playful mood he decided to bequeath knighthood upon his favorite dish—beef. Drawing his sword, he solemnly addressed the steak in front of him and said, "I dub you Sir Loin". Thus the choice upper loin cut of the steer became known as* "sirloin".

**A long record of strength, stability and progressive leadership has made the word Muehlstein—the First Name in Scrap Rubber.**

## H. MUEHLSTEIN & CO. INC.

**60 EAST 42nd STREET, NEW YORK 17, N. Y.**

**BRANCH OFFICES:** Akron • Chicago • Boston • Los Angeles • Memphis

**WAREHOUSES:** Jersey City • Akron • Boston • Los Angeles • Memphis

**CRUDE RUBBER · SYNTHETIC RUBBER · SCRAP RUBBER · HARD RUBBER DUST · PLASTIC SCRAP**

Weathering qualities of
RUBBER PRODUCTS
determined with reliable
accuracy in the

ATLAS *twin arc*
WEATHER-OMETER

Any selected cycle of exposure to sunlight and wetting can be set for automatic continuous testing in the Weather-Ometer. Exact tests can be duplicated at any time by settings on the control panel which contains temperature regulator—time meter—light and water cycle switch — automatic cut-off switch — voltage adjusting switch — direct reading thermal regulator — reactance coil (for economical current consumption). The Weather-Ometer is fully automatic in operation; can be left unattended over night; only necessary to renew carbons once in 24 hours. Years of exposure to any conditions of weathering reduced to a few days testing in the laboratory with the Weather-Ometer.

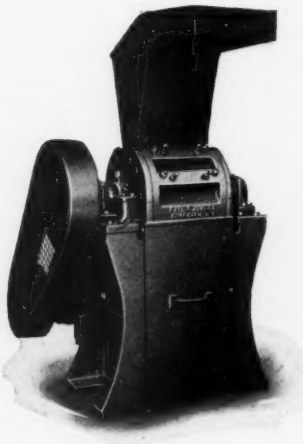
Originators and sole manufacturers of accelerated testing machines for over a quarter of a century. Fade-Ometer, Weather-Ometer, Launder-Ometer — the accepted standard testing machines used all over the world.

ATLAS ELECTRIC DEVICES CO.
361 West Superior Street, Chicago 10, Illinois

# NEW EQUIPMENT

## Ball & Jewell Rotary Cutters

The Rotary Cutters produced by Ball & Jewell, Inc., 24 Franklin St., Brooklyn 22, N. Y., are finding application in the cutting of foam scrap rubber. One of the most common applications is for reducing foam rubber up to 3/16-inch particles for the doll industry. Machines



are available that will give production from 50 pounds per hour up to 1,500 pounds per hour and will handle scrap in almost any condition.

Smaller models in the line are ideally suited for capacities up to 100 pounds hourly. Standard models fill the need of the average molder where small quantities of materials are required to be reduced. Stock up to ½-inch thickness is readily handled by machines of this type, one of which is depicted herewith. Larger stock models are powered by 5 hp motors and can handle materials 1-inch thick.

Ball & Jewell units have specially designed outboard anti-friction bearings which are completely independent of the end castings. Smaller and medium-sized machines have ball-bearings, while larger units have roller bearings. Each hopper is furnished with a non-electric permanent magnet to protect the machine from damaging tramp iron or steel. In usual dry cutting, specially designed positive end seals stop oil, grease or foreign matter from entering the cutting chamber. In wet cutting of inflammable materials these positive end seals prevent water from leaving the chamber to interfere with the bearing lubricant.

---

Powered for production, the new 2-ounce **Plastics Injection Press** produced by the Van Dorn Iron Works Co., Cleveland 4, Ohio, maintains up to 180 operating cycles per hour. Injection plunger and toggle mechanism of the H-200 are operated by hydraulic pressure developed by a pump driven by a 3 hp electric motor.

# NOT 1 BUT 5 PARACRIL WAREHOUSES...

## EXPEDITE YOUR ORDERS

**YOU CAN AVOID** costly delays or slow rubber shipments by contacting the nearest Enjay Paracril office when you need buna N-type rubber. Why? Because with *5* offices and *5* warehouses Enjay can process your orders ***fast*** and deliver shipments ***promptly***. And at each Enjay office, you'll find staff technicians always available to help you adapt Paracril to solve your problem or meet your needs.

Why not write or call today? We'll be glad to give you complete information about high-quality Paracril, the versatile rubber that does a desirable job!

ENJAY

PARACRIL®

**The special rubber that resists oil, air, water, heat, cold, and time.**

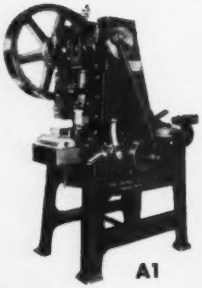
**Offices at:**
Boston 17, Mass., 135 Clarendon St.
New York 19, N. Y., 15 West 51st St.
Elizabeth 4, N. J., 125 Broad St.
Chicago 1, Ill., 221 N. La Salle St.
Los Angeles 11, Calif., 4814 Loma Vista Ave. (H. M. Royal, Inc.)

**Warehouses at:**
Los Angeles
Chicago
Baton Rouge, La.
Akron
Elizabeth, N. J.

*Pioneers in chemicals from petroleum: Additives, Alcohols, Esters, Ketones, Rubbers and Plastics*

**ENJAY COMPANY, INC., 15 W. 51st STREET, NEW YORK, N. Y.**

For MORE than Half a Century the name COULTER has meant MORE in higher quality cuttings . . . MORE IN GREATER PRODUCTION. So much MORE that . . .

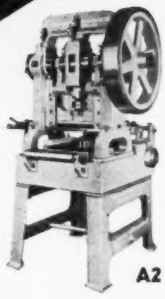


A1

# Men who Know PRODUCTION MACHINES Choose

the James COULTER Machine Co.
BRIDGEPORT, CONN.

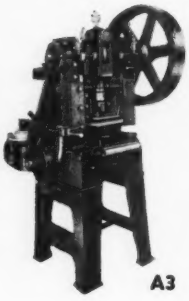
**MODEL A-1**
Cutting Heels at high speed production or short runs.



A2

**MODEL A-2**
Cutting Multiple Heels, Half and Full Soles with stock grain.

**MODEL A-3**
Cutting Multiple Heels and Taps with or across stock grain.



A3

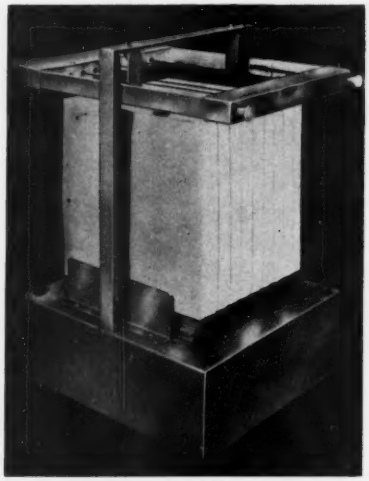
**MODEL A-2s**
(Not illustrated)
Cutting across grain of stock.

***COULTER PRODUCTION MACHINES SINCE 1896***



## Industrial Dry-Ice Slabber

A new electric unit which will automatically cut a standard dry ice block into slabs measuring 10 inches square by 1 inch thick has been developed by Foster-Built Bunkers, Inc., 757 West Polk St., Chicago 7, Ill. Low-voltage wires in a gravity feed frame do the cutting.



The unit is said to be completely safe and is equipped with an automatic switch that shuts off when splicing is completed. Where small cubes are desired, these slabs may be cut into 20 cubes measuring 2½ inches by 1 inch by means of a cuber which is also available from the company.

## DS Quick-as-Wink Valves

The design of the "DS" line of Quick-as-Wink valves manufactured by C. B. Hunt & Son, Inc., Salem, Ohio, assures positive performance and much greater operating force than is said to be possible with a large direct-connected solenoid. These valves employ small solenoids traveling through only a ⅛-inch stroke to move a small pilot valve plunger to apply air to the operating piston to move the main valve plunger back and forth. When the solenoid is de-energized the pilot cylinder is exhausted through the small pilot valve. The reduced amperage requirement of the small short stroke solenoid permits operation with standard types of pilot switches, avoiding intermediate relays and simplifying the electric control circuits. Housing and all internal parts, except the packing, are brass or bronze. Plungers and operating pistons are stainless steel. The line is furnished in ⅜, ½, ¾, 1, 1¼, 1½ and 2-inch sizes, with air to 200 psi, and with oil or water to 250 psi.

Designed for use with plastic molding machines, the **Stokes Dust Collector** manufactured by the F. J. Stokes Machine Co., Philadelphia 20, Penna., supersedes the old filter types. It also replaces the blower type with contaminative external exhaust. The unit is available in 90 CFM and 150 CFM capacities.

# RUBBER & PLASTICS MACHINERY BULLETIN

**Reporting News and Machine Design Developments**

IN BUSINESS TO **NRM** REDUCE YOUR COSTS

## Maximum Efficiency Calls For Special Extruder Screws

There is no such thing as a "standard" extruder screw where maximum efficiency is demanded. That's why NRM sells so many screws for other makes of tubers. Many factors enter into screw selection: the compound to be extruded, the cross section, tolerance and desired production rates. Long experience and close observation of extruder performance throughout the rubber and plastics field provides NRM engineers with an accurate guide for designing screws for specific jobs.

### Production Quality Depends on Design of Screw

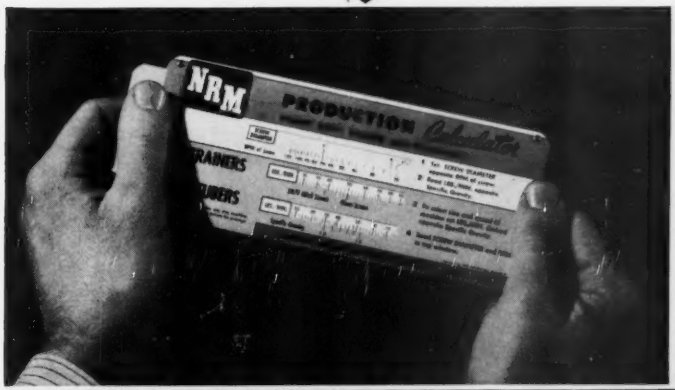
Rate, uniformity and density of the extrusion; horsepower consumed and heat generated in the stock are all affected by screw design and system of temperature control. These factors do not always have the same relation to each other due to variations in compounds. Therefore, selection of best screw characteristics is not an exact science, but depends largely on experience gained from working with many installations.

NRM offers you the benefit of such experience! Perhaps your present compounds are different than they were when you bought your extruders. It can pay you well to check the efficiency of your present screws. Consult with NRM—one of our many varieties may reduce your costs!

### New Extrusion Production Calculator Available

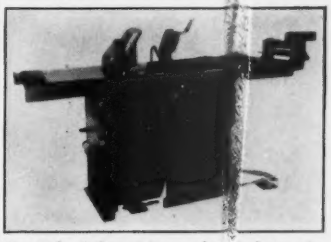
Now—NRM Engineers have developed a simple (see photo below) but accurate production calculator based on NRM extruder and strainer performance. With the calculator one can quickly determine output in lbs., horse power for various screw speeds taking into consideration the gravity of the stock.

*To get your calculator* write NRM in Akron Ohio (address below). Please use company letterhead and give title.




### WELDSTITCH TUBE SPLICER For Industrial Tire Inner Tubes

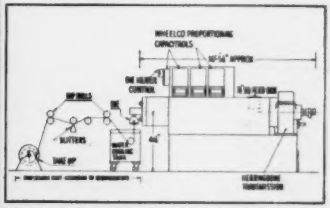
Industrial tire tubes are mostly still hand spliced because this operation has always presented a difficult problem. Now you can get a special NRM Weldstitch splicer for small diameter tubes. The NRM splicer does the job efficiently and economically. Rejects are reduced to a minimum.



The Tube Splicer (shown above) derives its name, "Weldstitch" from the appearance of the butt-spliced joint. Special serrated jaws knit the tube ends together—making an impression similar to stitches. The Weldstitch process is licensed. A larger machine is available for passenger and truck tubes up to 21" flat width. *Write for detailed information.*

### POLYETHYLENE SHEETING? YOU CAN EXTRUDE IT YOURSELF AND SAVE

Tire manufacturers are using more and more polyethylene film in place of other materials for protecting tacky surfaces such as camelback. It is also used to protect white sidewalls of tires and for many other purposes.



**Elevation shows NRM 4½" All-Electric Extruder with T-type polyethylene die, cooling tank, nip rolls and take-up.**

Where sizeable quantities are used, big savings can be made by purchasing polyethylene pellets and extruding the film. NRM provides complete polyethylene extrusion units including cooling tanks, wind-ups and embossing attachments.

**NATIONAL RUBBER MACHINERY CO.**

General Offices & Engineering Laboratories
Akron 5, Ohio

**PLANTS at Akron and Columbiana, Ohio and Clifton, N. J.**
**AGENTS East: National Rubber Machinery Co., Clifton, N. J.**
**West: S. M. Kipp, Box 441, Pasadena 18, Calif.**
**Rubber Machinery: GILLESPIE & COMPANY**
**96 Wall Street, New York 5, N. Y.**

*Creative Engineering*

OUTSTANDING for RUBBER
Natural or Synthetic
MAPICO
RED 297
Strong Color on the Orange Side
RED 347
Slightly Deeper Mass Tone with Blue Cast
RED 387
Still Deeper Mass Tone — Bluer Cast
IRON OXIDES OF EXCEPTIONAL PURITY

For wide variety of uses, high quality and uniformity these clean, bright reds are stand-outs. New, highly modernized plant and equipment and precise production controls have made them better than ever. Note these desirable characteristics.

- Clean bright color and tint
- Easy dispersion and processing
- Color permanence
- Exceptional strength
- Unusual purity
- Fine particle size
- Good aging behavior
- Moderate reinforcement
- Spheroidal particle shape
- Tear and flex resistance

For better color and better products use these MAPICO REDS in:

- High quality innertubes
- Footwear
- Rubber hose
- Drug items
- Sundries
- Chemical goods

LOOK TO MAPICO FOR LEADERSHIP

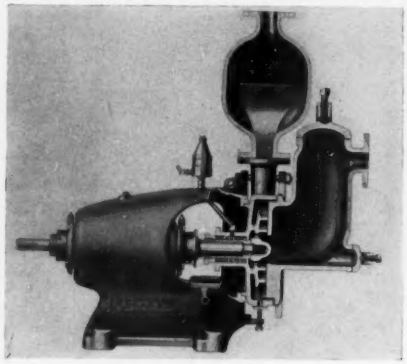
Our technical staff is at your service.

COLUMBIAN CARBON COMPANY
MAGNETIC PIGMENT DIVISION
MANUFACTURER
BINNEY & SMITH CO., Distributor
41 East 42nd Street • New York 17, N. Y.



## Model 40 Series R Durcopump

Among the advantages claimed for the Model 40 Series R Self Priming Durcopump produced by the Duriron Co., 17 East 42nd St., New York 17, N. Y., is the ability to prime in 22 seconds with a static lift of 15 feet. After being primed it maintains dry vacuum



as high as 28.4 inches Hg. This new pump is now available in two sizes, one with capacity ranging from 20 GPM against 81 feet TDH to 160 GPM against 33 feet TDH and the other with capacity ranging from 40 GPM against 125 feet TDH to 240 GPM against 75 feet TDH when operating at 1750 RPM. The pump is offered in 12 Durco corrosion resisting alloys, and permits conversion of wet end parts from one alloy to another without changing the working dimensions or the power end.

---

Developed for continuous and automatic viscosity control, the **Brookfield Viscotrol,** designed by the Brookfield Engineering Laboratories, Inc., Stoughton, Mass., is intended for use where viscosity variations during production normally occur only in one direction and it is desired to accomplish continuous and automatic viscosity control.

SEE PAGE 382

# HIGH GRADE CALCIUM CARBONATE EXTENDERS AND FILLERS FROM SELECTED CRYSTALLINE MARBLE

## GamaCo

Because of its low top particle size, GamaCo gives unusual performance as to extrusion rate, flex resistance, and abrasion resistance. In comparison with other similar pigments it will show moderate increases in modulus and tensile strength. These tendencies are due in part to its straight line distribution—and the absence of an excess of extreme fines. GamaCo disperses relatively quickly and thoroughly.

## CALWHITE

Calwhite's particle size range makes it of interest in extruded goods and proofed goods where dry ground products (a small percentage of the particles which are usually over 40 microns) create processing and finishing problems. Compared with other similar pigments the slight reduction in its particle size permits increased loadings of 20-50% without loss of physical properties.

## CHECK THESE ADVANTAGES OF GEORGIA MARBLE CALCIUM CARBONATE

1. Uniformity of color, particle size, moisture content, packaging—safeguarded by constant control.
2. Unlimited company owned and operated natural resources.
3. Three large New Mills (built post war) with the most modern equipment for producing water ground and air floated, classified calcium carbonate pigments.
4. A milling capacity large enough to fill all orders promptly—regardless of size.
5. A wide range of particle sizes from 200 mesh to minus 10 microns.
6. Mixed carloads at carload prices.

PRODUCED BY

**CALCIUM PRODUCTS DIVISION**

**The Georgia Marble Co., Tate, Georgia**

***Products and information available through the following representatives:***

Akron Chemical Co., Akron 4, Ohio
John K. Bice Co., Los Angeles 13, Cal.
George C. Brandt, Inc., St. Paul 4, Minn.
Joseph C. Burns & Co., Pittsburgh, Pa.
Commercial Chemical, Ltd., Vancouver, B. C.
Deeks & Sprinkel Co., Cincinnati 2, Ohio
Deeks, Sprinkel & Miller, Inc., Louisville 2, Ky.
R. L. Ferguson & Co., Milwaukee 2, Wis.
Gesco Corp., Dunedin, Fla.
Griffith-Mehaffey Co., Inc., New Orleans 12, La.
C. P. Hall Co. of Ill., Chicago 38, Ill.
R. T. Hopkins & Co., Atlanta, Ga.
Harry C. Node & Co., Houston 19, Tex.
Morton-Meyers Co., Kansas City 8, Mo.
Pacific Coast Chemicals, San Francisco, Cal.
Norman G. Schabel, Cleveland, Ohio
Smith Chemical and Color Co., Brooklyn, N. Y.
Standard Chemical Co., Ltd., Leeside, Toronto, Ontario
Standard Chemical Co., Ltd., Montreal, Quebec
Tamms Industries, Inc., Chicago, Ill.
Zehrung Chemical Co., Portland 9, Ore.
Zehrung Chemical Co., Seattle, Wash.

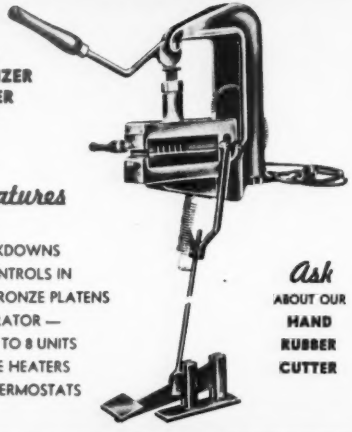
**T. N. Loser, Mgr. Eastern Sales Office, Plainfield, N. J. Warehouse, Brooklyn, N. Y.**

Reduce Accidents
Like This With the New

You will find that the new Thropp Hydraulic Brake will stop the travel of in-running rolls almost instantly.
They can be applied to any existing mill or calender in your plant. We will be glad to send you complete installation data on request.

THROPP
WM. R. THROPP & SONS CO. Trenton, N.J.

THE SMACO GASKET SPLICER



SPLICER
VULCANIZER
EMBOSSER
MOLDER

Features
- SPEED
- NO BREAKDOWNS
- HEAT CONTROLS IN BOTH BRONZE PLATENS
- ONE OPERATOR — FROM 1 TO 8 UNITS
- LONG LIFE HEATERS AND THERMOSTATS

Ask ABOUT OUR HAND RUBBER CUTTER

For Further Information . . . . Write to
SIVON MACHINE & MFG. CO.
PAINESVILLE, OHIO




## New Pyro Surface Pyrometer

An accurate and universally adaptable method for determining surface and sub-surface temperature in almost every industrial plant or laboratory is provided in a new Pyro Surface Pyrometer manufactured by the Pyrometer Instrument Co., Bergenfield, N. J. The new instrument features a large 4-inch direct reading indicator mounted in a rubber cushioned housing. Two distinct series of models offer either a rigid extension arm or a long 42-inch flexible arm suitable for use with any one or more of a selection of eight types of available thermocouples. Each series of instruments is available in four temperature ranges from 0 to 400° F. to 0 to 1200° F., and all thermocouples may be interchanged without adjustment or recalibration.

## Gerotor May PneuBin

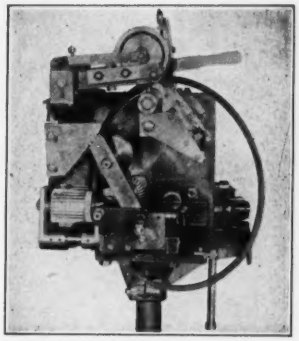
A new solution to the problem of feeding stubborn materials through bins and hoppers is provided by the PneuBin, a pneumatic device manufactured by the Gerotor May Corp., Baltimore 3, Md. The unique PneuBin principle, perfected in conjunction with the B. F. Goodrich Co., permits closed bin tops and bin storage of materials previously considered impossible to feed from bins. Pulsating PneuBin panels mounted on the inside walls of bins or hoppers keep materials moving by positive displacement thus preventing arching, funneling or tunneling. Flexible covers for the panels are made of reinforced, highly abrasion-resistant Goodrich Armorite Rubber. Air flow to and from the panels is automatically regulated by the "Pulsatrol" unit, permitting selection of a wide range of pulsation frequency, force and amplitude.

The **Portelevator Stacker** designed by the Hamilton Tool Co., Hamilton, Ohio, has a platform which automatically locks at any position stopped, and cannot slip or settle under the load. Of fabricated construction, the unit is 70 inches high, 32 inches wide and 42 inches long with a platform size of 26 inches from side to side and 24 inches from front edge to back. It has a load capacity of 1,000 pounds.

**Utility Crimper Type Flipper**

***for***

**Truck and Large Balloon Tires**



**UTILITY MANUFACTURING COMPANY**

**Cudahy, Wisconsin**

Cable Address: UTILITY-MILWAUKEE

Long Distance Phone Call

MILWAUKEE—SHERIDAN 4-7020

**AGING APPARATUS**

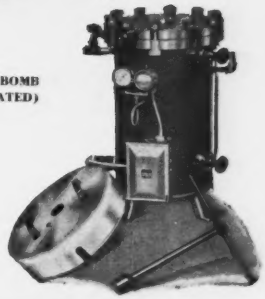
**for the**

**RUBBER**

**LABORATORY**

COMBINATION BIERER-DAVIS OXYGEN AGING AND AIR HEAT TEST OUTFIT

AIR AGING BOMB (STEAM HEATED)

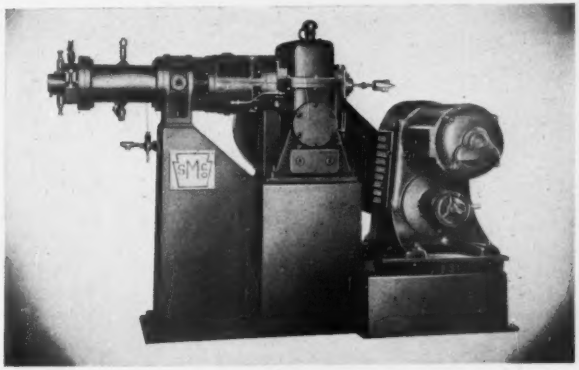


**EMERSON APPARATUS COMPANY**

**183 Tremont Street, MELROSE, MASS.**

**TAILORED TUBERS!**

Davis-Standard Extruders are functionally designed. For that reason they are readily adaptable and we build most of them to customer's exact requirements. This custom-building often costs less, always produces more efficiently. Whether *your* extrusion project is a normal or a special one, it will pay to investigate Davis-Standard equipment.



2" Davis-Standard Rubber Extruder, Straight Head.

***Extruding Machines For Every Rubber & Thermoplastic Job.***

*"People Who Know, Order Four In A Row!!"*

**The STANDARD MACHINERY COMPANY**

**MYSTIC, CONN.**

Est. 1848

Export Office: Drexel Bldg., Philadelphia 6.

Canada: Williams & Wilson, Ltd., Montreal, Toronto.

Pacific Coast: W. H. Del Mar Co., 5140 Crenshaw Blvd., Los Angeles.

Chicago Grant Engineering Co.

T-C

TANNEY-COSTELLO
INC.
CABLE ADDRESS "COSTAN" AKRON
P.O. BOX 1113
868 E. TALLMADGE AVE.
AKRON 9, OHIO

Scrap Rubber

•

Natural Rubber

•

Plastic Scrap

Representatives for:

S. J. PIKE & CO., INC.
Crude Rubber Importers
30 Church Street
New York 7, New York

# REVIEWS

## BOOKS

**Die Thermodynamik des Warme- und Stoffaustausches in der Verfahrenstechnik. (Thermodynamics of Exchange of Heat and Matter in Industry).** By Dr. Werner Matz. Published by Verlag Dr. Dietrich Steinkopff, Frankfurt (Main), Germany. 6¼ x 9 in. 356 pp. Price: DM 28.

This book is intended to convey to the industrial engineer the thermodynamical principles required for a thorough understanding of the problems concerning the exchange of heat and matter in industrial operations. The problems of distillation, adsorption, absorption and extraction are dealt with in great detail. Engineers working in the fields of mineral oils, textiles, paper, sugar and general chemical industries should derive valuable assistance from this volume. The mathematical methods used are supposed to be understood by the average chemical engineer. Graphical presentation and solution of problems was preferred in many places to mathematical methods because of their greater appeal to the practical engineer. A knowledge of the general principles of thermodynamics is indispensible for a thorough understanding of this volume. The vectorial treatment of thermodynamics of cyclic processes is presented in an addendum. E. S.

•

**Symposium on Effects of Low Temperatures on the Properties of Materials.** American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 68 pp. $1.50.

The papers and discussion in this booklet were presented in two sessions at a meeting of the Philadelphia District of the A.S.T.M., held in Philadelphia on March 19, 1946. It covers the fields of both ferrous and non-ferrous metals, plastics and rubbers. Following an introduction by A. O. Schaefer, of the Midvale Co., the booklet contains four profusely illustrated papers, as follows: (1) Low Temperature Behavior of Organic Plastics, by H. K. Nason, T. S. Carswell, and C. H. Adams; (2) Low Temperature Properties of Elastomers, by John W. Liska; (3) Effects of Subatmospheric Temperatures on the Properties of Non-Ferrous Metals, by Norman L. Mochel; (4) The Properties of Weldments at Low Temperatures, by Robert D. Stout.

## BOOKLETS, CATALOGS, etc.

**Indonex Plasticizers as Crystallization Retarders in Neoprene Compounds.** (Circular No. 13-38). Indoil Chemical Co., 910 So. Michigan Ave., Chicago 80, Ill. 8½ x 11 in. 8 pp.

The investigation of Indonex plasticizers as retarders of crystallization of both uncured and cured Neoprene GR-M and Neoprene RT compounds is reported in this technical bulletin. The results cover two series of compounds using Thermax at 40 volume loading (58 parts/100) and at 80 volume loading (116 parts/100). Ten compounds in all were tested in the investigation. The results are reported to indicate that Indonex is outstanding for this purpose.

•

**Fatty Acids in Modern History.** A. Gross & Co., 295 Madison Avenue, New York 17, N. Y. 8½ x 11 in. 36 pp.

This booklet presents, under one cover, a convenient listing of normal specifications for those basic fatty acids of industry manufactured by the company. Each of the fatty acids is broken down as to titre, iodine value, saponification value, acid value, unsaponifiable %, color, etc. The different fatty acids discussed include single, double and triple stearic acid, red oil, coconut fatty acids, soya fatty acids, cottonseed fatty acids, hydrogenated tallow, etc. A chart outlining the color relationship in Gardner 1933 series is also included.

# RANDALL & STICKNEY
## Hand Grip Rubber Gauge No. 3-B

| | | |
|---|---|---|
| Height .....9" | Length .....9¾" | Range .....½" |
| Depth of Throat ....6½" | Dia. 50 Divisions Each Div. 1/1000" | Weight ....4 lbs. Frame Aluminum |

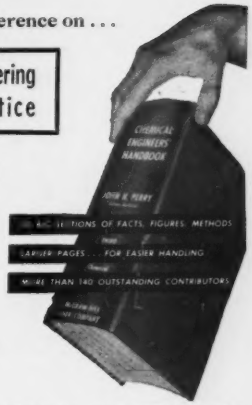
Designed for gauging stock as it is coming from the calender.

**FRANK E. RANDALL CO., Waltham 54, Mass.**

The world's standard reference on . . .

**Modern chemical engineering fundamentals and practice**

The 3rd edition of this standard chemical engineering reference work brings you a fresh and comprehensive coverage of both standard and recently compiled facts, figures, and methods applicable not only to chemical engineering but to related fields.




The new 3rd Edition

*Perry's*

## CHEMICAL ENGINEERS' HANDBOOK

*Prepared by a Staff of Specialists, John H. Perry, Editor, Technical Investigator, E. I. DuPont de Nemours & Co.*

**1942 pages, 7¼" x 9⅞", $15.00**

*(add 2% sales tax for copies sent to N.Y.C.)*

- Over 2000 graphs, tables, etc.
- Fully revised
- Thumb-indexed
- Larger pages

Details of developments in every branch of chemical engineering—including those of recent critical years—are presented by more than 140 recognized authorities . . . to bring you up to date on technical data—on new procedures, modern applications, new equipment, etc.

Send orders to

**RUBBER AGE, 250 W. 57th St., N. Y. 19**

# HEAVY DUTY *Mills . . .*

Typical of the NE line of heavy duty mixing mills is the 22" x 22" x 84" mill shown at the right. We are prepared to meet your specifications from blueprint to finished mill. Our large, medium and small steel foundries coupled with extensive machine shop facilities permit us to assume full responsibility for your mill equipment. Consult with N.E. engineers.

## . . . *to* LAB MILL

NE 6" x 6" x 12" Self-Contained Laboratory Mixing Mill.

SEND YOUR SPECIFICATIONS

# NATIONAL ERIE CORPORATION

ERIE, PENNSYLVANIA • U. S. A.

# The Institution of the Rubber Industry

LONDON

THE RUBBER INDUSTRY owes its development largely to scientific and technical research and the Institution was founded in 1921 to foster scientific and technical advancement and to disseminate the results.

THE INSTITUTION TODAY is the centre of a great fraternity of rubber manufacturers, scientists, technologists, research establishments, executives and students from every country whose object is the advancement of the cause of the rubber industry throughout the world.

OBJECTS: To promote corporate and concerted effort in the industry by bringing together all those engaged or interested in the various branches of science and technology on which the Industry is based and co-ordinating their respective contributions.

To promote the profession and practice of Rubber Technology.

To encourage the extension of scientific and technical education in the principles and details of rubber manufacture.

To maintain a scheme of Diplomas for the recognition of efficiency in knowledge of all branches of technology essential to the successful maintenance and development of rubber manufacture.

To arrange for the holding of meetings, the reading of papers and the giving of lectures with subsequent discussions and publication.

To foster the systematic study of scientific and technical problems involved in the various phases of the manufacture of natural and synthetic rubbers and rubber-like materials and their conversion into finished products.

To encourage original work and research dealing with the manufacture of rubbers.

PUBLICATIONS.

The Transactions: Bi-monthly record of scientific and technological investigations in the realm of rubber and its allied industries.

Annual Report on the Progress of Rubber Technology: containing systematic accounts of the developments in rubber technology from year to year.

Proceedings of Rubber Technology Conferences.

INVITATION TO MEMBERSHIP.

At this time of progress and expansion in the affairs of the Institution, its Council, conscious of the benefits that lie within the sphere of the Institution, invites applications for the privilege of membership from those engaged or interested in the Rubber and its allied industries.

*Application forms and full particulars may be obtained from:—*

**THE REGISTRAR**
**INSTITUTION OF THE RUBBER INDUSTRY**
**12, WHITEHALL**
**LONDON, S.W. 1, ENGLAND**


## REVIEWS (CONT'D)

**Titanox Pigments: Properties and Uses.** Titanium Pigment Corp., 111 Broadway, New York 6, N. Y. 8½ x 11 in. 64 pp.

The extensive development of Titanox titanium dioxide pigments within the past few years makes this new and complete book a necessary guide to users of the product. Expanded information presented includes descriptions of new products and new applications, with charts and many illustrations. The magnitude and completeness of the mining, manufacturing and research activities of the Titanium Division of the National Lead Co. are indicated, together with the sales and service facilities of the Titanium Pigment Corp., sole sales agent for Titanox pigments. The properties of the pigments are presented in some detail, but the discussion of their uses is accordingly brief in view of the different aspects the same use may exhibit within a given industry. However, the salient features of each application of the pigments are presented. A complete table of contents is furnished.

•

**Cellulose Acetate Molding Powder.** Cellulose Products Department, Hercules Powder Co., Wilmington, Del. 8½ x 11 in. 16 pp.

The properties and applications of the company's cellulose acetate molding powders are described in this technical booklet. Among the four molding powder formulations discussed, each of which is available in several flow types, one self-extinguishing type is especially suitable for use in applications which must pass tests by Underwriters' Laboratories, Inc., for flame resistance. Information such as molding powder types, flow types, colors, packaging, and handling is included in the booklet. Tables and charts on test data for the cellulose acetate molding powders are included in the appendix of the booklet as well as brief descriptions of the tests used in obtaining the data. Typical applications are listed according to the molding powder types and representative applications are illustrated by photographs of plastics products.

•

**Milton Roy Pumps for Controlled Volume Pumping.** (Bulletin No. 450). Milton Roy Co., 1300 E. Mermaid Lane, Chestnut Hill, Philadelphia 18, Penna. 8½ x 11 in. 16 pp.

Applications, design details and advantages of the "aiRoymetric" pumps produced by the company are presented in this bulletin. Typical available feed systems are discussed including constant speed, blending and formulating and hydrostatic test pressure units. Systems for sampling industrial wastes are also described. Auxiliary equipment for use with "aiRoymetric" and "aiRoy" pumps is described and illustrated. The different systems and units are completely diagrammed. Sectional and cutaway views are also presented.

•

**Isocyanate-Based Adhesives.** (Technical Bulletin No. P-145). Phosphate Division, Monsanto Chemical Co., St. Louis 4, Mo. 8½ x 11 in. 14 pp.

A comprehensive review of the development and present practice, both German and American, of isocyanate-based adhesives is contained in this technical bulletin. In addition to offering an explanation of the mechanism of the adhesion attributable to the diisocyanates, the bulletin contains chemical and physical properties of two diisocyanates available. Examples of German and American practice, including formulations for bonding various combinations of materials, are also detailed.

•

**Packaged Oil Hydraulic Lead Encasing Press for the Cable and Rubber Hose Industries.** John Robertson Co., Inc., 121 Water Street, Brooklyn 1, N. Y. 8½ x 11 in. 4 pp.

This brochure illustrates and describes the new self-contained "packaged" oil hydraulic and lead encasing press made by the company. Capacities and automatic control features of the press are outlined. Open and sectional views of the "Electraulic" pump are provided.

**Akroflex F: An Anti-Flex-Cracking Antioxidant.** By M. F. Torrence and D B. Forman. Rubber Chemicals Division, E. I. du Pont de Nemours & Co., Wilmington, Del. 6¼ x 9¼ in. 8 pp.

The chemical and physical properties of Akroflex F, the latest addition to the well-known series of Akroflex antioxidants, are outlined in this technical bulletin. A comparison of Akroflex F and Thermoflex A in a typical compound is shown both for flex-cracking characteristics and road test performance. Detailed data on the stress-strain properties of the vulcanizates are given.

•

**Ratotherm and Ratogage Temperature and Pressure Instruments.** (Preliminary Issue Catalog 86). Fischer & Porter Co., Hatboro, Penna. 8½ x 11 in. 12 pp.

This booklet describes and illustrates Ratotherm and Ratogage temperature and pressure instruments, including combinations of temperature, pressure, flow, etc., in one instrument case. It also discusses cascade control. Also included is a description of the Type 3 Pneumatrol unit with a proportional band, automatic reset and derivative action control. The booklet is bound in handy loose-leaf style.

•

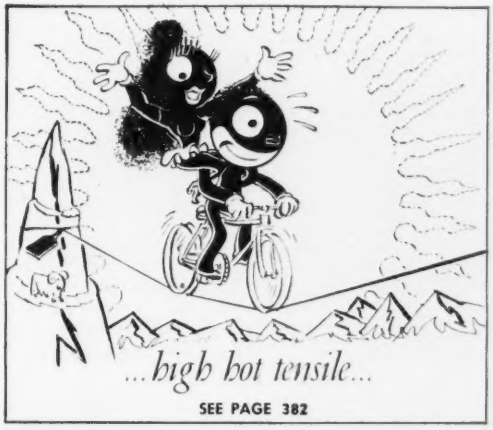
**Plastolein Products.** Emery Industries, Inc., 4300 Carew Tower, Cincinnati 2, Ohio. 8½ x 11 in. 16 pp.

Physical and chemical data outlined in this booklet cover the plasticizers for rubbers, vinyls and cellulosics produced by the company. Special fatty acids and Emery dimer acids are also discussed. Performance data as well as specifications and characteristics are presented for each of the products under discussion. The booklet is illustrated with charts, graphs and photographs.

•

**Upholstering with Latex Foam.** Natural Rubber Bureau, 1631 K St., N. W. Washington 6, D. C. 8½ x 11 in. 18 pp.

The benefits to be derived from the use of latex foam cushioning in upholstering home and office are described in this bulletin, one of a series advancing the use of natural rubber. Types of latex foam units available, the manner in which they can be used and some typical applications are discussed. The bulletin is illustrated with many different drawings.



SEE PAGE 382

Vulcanized
VEGETABLE OILS
RUBBER SUBSTITUTES
Types, grades and blends for every purpose, wherever Vulcanized Vegetable Oils can be used in production of Rubber Goods—be they Synthetic, Natural, or Reclaimed.
*A LONG ESTABLISHED AND PROVEN PRODUCT*
THE CARTER BELL MFG. CO.
SINCE
CARTER BELL PRODUCTS
1903
SPRINGFIELD, NEW JERSEY
Represented by
HARWICK STANDARD CHEMICAL CO.
Akron, Boston, Trenton, Chicago, Denver, Los Angeles

EXCLUSIVE AGENTS

RCMA
RAY-BRAND
Centrifuged Latex

REVERTEX
72-75% Latex Concentrate

- Normal Latex
- GR-S Latex Concentrate
- Natural and Synthetic Latex Compounds

We maintain a fully equipped laboratory and free consulting service.

LATEX DIVISION
RUBBER CORPORATION OF AMERICA
274 Ten Eyck Street, Brooklyn 6, N. Y.
111 West Monroe Street, Chicago 3, Ill.

SALES REPRESENTATIVES: Charles Larkin II, 250 Delaware Ave., Buffalo 2, N.Y.; H. L. Blachford Ltd., 977 Aqueduct St., Montreal 3, Canada; Ernesto Del Valle, Tolsa 64, Mexico D.F.

VINYL COMPOUNDERS

Check these 7 Advantages of STAFLEX® IXA

The inclusion of STAFLEX IXA generally offers:

Better Processing Properties
Improved Aging
Elimination of rubber-like surface and feel
Lower Permanent Set
Lower Low-Temperature Limits
Lower Volatility or heat loss

*For technical bulletin on IXA or any other STAFLEX Plasticizers and Stabilizers*

*Write Dept. RA 7*

DEECY PRODUCTS CO.
PLASTICIZERS STABILIZERS
120 Potter St., Cambridge 42, Mass.

## Electric Power Distribution Systems

*(Concluded from page 442)*

Cost of losses has not been considered in the comparisons presented since they did not appear to be sufficiently different to affect the decisions. For the small plant the higher losses of low voltage cables is offset by the higher reactive current required for transformers for magnetizing current where high voltage distribution is used.

The following conclusions may be used as a guide in selection of voltage for the small rubber or plastics plant:

1. Supply voltage 2300 or 4160: (a) Large motors supplied directly or 2300 or 4160 volts; (b) Small motors supplied at 480 by unit substations; (c) About 150 to 200 horsepower may be the dividing point between 440 and 2300 volt motors except (1) where there are long runs of cable as to remote pumps, and (2) where there are voltage dip problems on the 440 volt supply.

2. Supply voltage above 15 kv. In general, transform all power to 2300 volts for large motor supply and for distribution to 460 volt unit substations for small power and lighting. Where there are large distances between the large motors or between the stock processing areas and finishing areas 4160 volts should be considered.

3. Supply voltage 5 to 15 kv. In general, use incoming voltage as distribution voltage supplying unit substations for 2300 and 460 volt supply. For very small plants conclusions are the same as for supply above 15 kv, although there is less disadvantage in adopting 440 volts for the stock processing machines.

LITERATURE REFERENCES

(1) Beeman, D. L., and Kaufmann, R. H., The Fundamentals of Industrial Distribution Systems, *Trans. Am. Inst. Elec. Engrs.*, Vol. 61, pp. 272-79 (1942)
(2) Beeman, D. L., Combined Light and Power Systems for Industrial Plants, *Trans. Am. Inst. Elec. Engrs.*, Vol. 65, pp. 76-83 (1946).
(3) Anderson, A. E., and Black, C. H., Protection of Low-Voltage Circuits by Air Circuit Breakers in Cascade Arrangements, *Trans. Am. Inst. Elec. Engrs.*, Vol. 60, pp. 1151-60 (1941).

SEE PAGE 382

# MAGNESIA

**FOR USE WITH NATURAL AND SYNTHETIC**

# RUBBER

**for all compounding purposes**

**Genmag Technical—**
with neoprene, for scorch resistance

**Extra Light Calcined Magnesia—**
for excellent scorch resistance and high tensile, fast cures

**Light Calcined Magnesia No. 101—**
low in price; high in effectiveness

**Heavy Calcined Magnesia—**
low manganese types in a variety of finenesses

**Magnesia Carbonate—**
light, fine, and pure

Send for samples and quotations

**GENERAL MAGNESITE & MAGNESIA COMPANY**

**BOX 671** **NORRISTOWN, PA.**

Specialists in Magnesia

MANUFACTURERS — IMPORTERS — DISTRIBUTORS

# *Armour's Fatty Acids for Rubber*

| | |
|---|---|
| **RUBBER STEARIC** | **OLEIC ACID** |
| **DOUBLE PRESSED STEARIC** | **RED OIL** |
| **PURE STEARIC** | **CORN OIL ACID** |

***Manufactured By***

**ARMOUR CHEMICAL DIVISION**

***Represented By***

**TUMPEER CHEMICAL CO.**

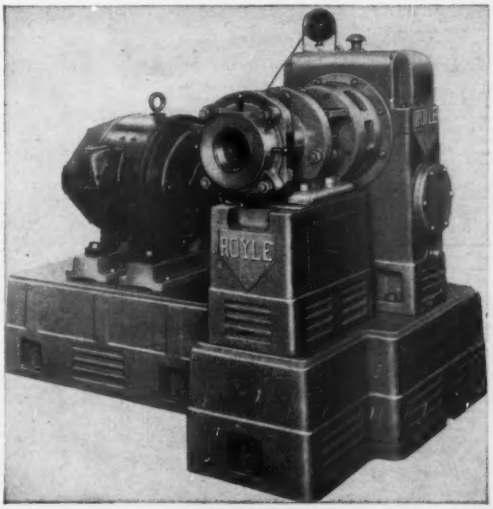
333 NORTH MICHIGAN AVENUE

CHICAGO 1, ILLINOIS

# *Designed To Extrude RUBBER or PLASTICS*

IN these days of rapidly changing developments owners of Royle extruding machines are in the advantageous position of being able to adapt their extruders to either rubber or plastics production. If you are faced with the problem of extruding rubber and plastics the versatility of ROYLE extruders is of paramount importance to you. Whether you require a light or heavy production extruder features have been incorporated to assure maximum results. The change-over is quickly and simply accomplished.

Send for your copy of Bulletin No. 448. It describes these features and how they may be applied to older type extruders.




ROYLE #2 Extruding Machine. Non-extended cylinder, plain tubing head.

**JOHN ROYLE & SONS** ROYLE PATERSON N. J.

*PIONEERED THE CONTINUOUS EXTRUSION PROCESS IN 1880*

| London, England | Home Office | Akron, Ohio | Los Angeles, Cal. |
|---|---|---|---|
| James Day (Machinery) Ltd. | J. W. VanRiper | J. C. Clinefelter | H. M. Royal, Inc. |
| REgent 2430 | SHerwood 2-8262 | JEfferson 3264 | LOgan 3261 |

**PATERSON 3, NEW JERSEY**

# MARKETS

***Rubber – Crude, Reclaimed and Scrap – Cotton – Ducks – Tire Fabrics – Sheetings***

***NEW YORK, JULY 6, 1950***

## Natural Rubber

The price of natural rubber continued its erratic course during the past period with the price of spot rubber reaching 33.50 cents on June 8 and 9, only to fall off to a low of 28.50 cents on June 13 and 26, representing a differential of 5 cents. The average price of spot rubber for the month of June was 30.92 cents based on 22 trading days. This compares with an average of 28.07 cents in May.

Trade circles are of the opinion that a rather precarious situation exists as far as the natural rubber market is concerned. It is felt that the Far Eastern situation will continue to be uncertain for an indefinite period. In view of the high rate of consumption, manufacturers' inventories are extremely modest. Imports of natural rubber have not been sufficient to maintain desired stockpiles.

The Government's recent decision to re-open a synthetic rubber plant, will, after a period of time, permit consumers to obtain desired quantities of synthetic. This, in turn, should relieve demand upon natural rubber. The relative supply of natural rubber would then be greater, permitting a greater accumulation of natural rubber for the Government stockpile.

Higher prices witnessed during the latter part of the period have been attributed to the Korean situation and the threat of war. Already, extra consumer demand for tires, prompted by fear of shortages in the near future, has placed pressure upon manufacturers.

Today's quotations on the outside market, London and Singapore, follow:

### Outside Market

| | |
|---|---|
| No. 1 Ribbed Smoked Sheets: | |
| Spot | .33¾ |
| July | .33½ |
| August | .31¾ |
| Thin Latex Crepe: | |
| Spot | .35 |
| July | .34½ |
| Thin Brown Crepe, No. 2 | .29¼ |
| Ambers, No. 3 | .29¼ |
| Flat Bark Crepe | .26½ |

### London Market
*(Standard Smoked Sheets)*

| | |
|---|---|
| August | 30.48 - 30.77 |
| September | 29.90 - 30.04 |

### Singapore Market
*(Standard Smoked Sheets)*

| | |
|---|---|
| August | 27.05 - 27.12 |

## Synthetic Rubber
*(Dry Types-Per Pound)*

| | |
|---|---|
| Butaprene NF | .440 - .450 |
| Butaprene NL | .450 - .460 |
| Butaprene NAA | .490 - .500 |
| Butaprene NXM | .520 - 530 |
| Chemigum 30 N4NS | .400 - .470 |
| Chemigum 50N4NS | .400 - .470 |
| Chemigum N3 | .450 - .520 |
| GR-I | —— - .185 |
| GR-S | —— - .185 |
| Hycar OR-25 | .450 - .460 |
| Hycar OR-15 | .520 - .530 |
| Hycar OS-10 | .500 - .510 |
| Neoprene Types CG and AC | —— - .500 |
| Neoprene Type E | —— - .650 |
| Neoprene Types FR and KNR | —— - .750 |
| Neoprene Type GN | —— - .320 |
| Neoprene Type GN-A | —— - .320 |
| Neoprene Type RT | —— - .350 |
| Neoprene Type S | —— - .320 |
| Neoprene Type W | —— - .350 |
| Paracril 18 | .430 - .450 |
| Paracril 26 | .440 - .460 |
| Paracril 35 | .510 - .530 |
| Silastic (compounded) | 2.35 - 4.40 |
| Thiokol Type A | .370 - .470 |
| Thiokol Type FA | .520 - .620 |
| Thiokol PR-1 | .750 - .850 |
| Thiokol Type ST | .750 - .850 |

## Scrap Rubber

Increased demand for reclaim due to the shortage of GR-S and the high price of natural rubber has forced the market for scrap rubber to new high levels. Substantial increases in demand have been noted for all grades with mixed passenger tires moving exceptionally well. In accordance with the strengthened market, prices for scrap rubber have been revised to reflect current conditions. Current quotations follow:

| | | |
|---|---|---|
| Mixed passenger tires | ton | $15.00 |
| Beadless truck tires | ton | nom. |
| Mixed truck tires | ton | 18.00 |
| Beadless passenger tires | ton | nom. |
| No. 1 passenger peelings | ton | 50.00 |
| No. 1 truck peelings | ton | 50.00 |
| Red passenger tubes | lb. | .08¾ |
| Black passenger tubes | lb. | .06 |
| Mixed passenger tubes | lb. | .05 |
| No. 2 truck tubes | lb. | nom. |
| Red truck tubes | lb. | .08¾ |
| Black truck tubes | lb. | .06 |
| Buffings | ton | 20.00 |

## Reclaimed Rubber

Consumption of reclaim for the month of May was estimated at 24,305 tons by the Department of Commerce, compared with the 21,318 tons consumed in the previous month. The demand for reclaimed rubber continues at a brisk level, probably as a result of the shortage of GR-S and the continued high price of natural rubber. It is expected that the increased demand will hold for the next few months. Prices have been revised upwards during the period. Current quotations follow:

***Tires***

| | | |
|---|---|---|
| Black, Digester (Natural) | lb. | .09 - .09½ |
| Peels No. 1 | lb. | .09½ - .10 |
| Whole Tire (Blend) | lb. | .08¾ - .09¼ |

***Inner Tubes***

| | | |
|---|---|---|
| Black (Natural) | lb. | .12¾ - .13¼ |
| Red (Natural) | lb. | .15½ - .16 |
| Butyl | lb. | .09 - .09½ |

***Shoe***

| | | |
|---|---|---|
| Unwashed (Natural) | lb. | .08¾ - .09¼ |

## Cotton Tire Fabrics

Prices for cotton tire fabrics have been revised slightly during this past period to more accurately reflect strengthened market conditions. The increased production of tires has acted to bolster the market for cotton tire fabrics. In addition, the continued shortage of synthetic fibers for use in tire fabrics has accelerated the demand for the cotton product. It seems likely, at this time, that the production of tires will remain high during the next few months. In this case, the market for cotton tire fabrics will continue at a moderately high level. Current quotations follow:

| | | |
|---|---|---|
| Standard, Peeler, 12/4/2 | lb. | .68½ |
| Standard, Peeler, 14/4/2 | lb. | .70½ |
| Standard, Peeler, 16/4/3 | lb. | .73 |
| Extra Staple, Peeler, 12/4/2 | lb. | .84 |
| Extra Staple, Peeler, 14/4/2 | lb. | .86 |
| Extra Staple, Peeler, 16/4/3 | lb. | .89 |

## Chafers

| | | |
|---|---|---|
| 14.4 oz. (per sq. yard) | lb. | .67½ |
| 9.25 oz. (per sq. yard) | lb. | .64 |
| 11.65 oz. (per sq. yard) | lb. | .61 |
| 8.9 oz. (per sq. yard) | lb. | .65½ |

## Cotton

The market for middling uplands on the Cotton Exchange has moved in a range of 80 points since our last report (June 7), high for the period being 35.10 cents reached on July 5, and low being 34.30 cents reached on June 19. The average price of middling uplands for June was 34.61 cents based on 22 trading days. This compares with an average of 33.64 cents in the previous month.

The Commodity Credit Corporation has announced loans on 1949 crop cotton through June 29 on 3,190,087 bales. Repossessions during the same period amounted to 1,997,771 bales, leaving a net stock of 1,192,316 bales. Loans for the corresponding period last season amounted to 5,271,149 bales and repossessions totaled 1,374,509 bales.

With current economic conditions favorable, world activity is increasing over a wide area, the International Cotton Advisory Committee reports. In its June review, the ICAC said cotton consumption in countries accounting for about two-thirds of the world total was 2% higher in the first quarter of 1950 than in the preceding three months.

The Tariff Commission has begun a supplemental investigation of harsh or rough cotton quotas with a hearing scheduled for July 18 in Washington, D. C. The principal object of this supplemental inquiry is to consider applications made to the commission for a special quota of 2,500,000 of this type of harsh or rough cotton to meet special requirements during the current quota year.

Quotations for middling uplands on the Exchange follow:

| | June 7 | July 6 | | |
|---|---|---|---|---|
| | Close | High | Low | Close |
| July | 33.49 | 33.75 | 33.67 | 33.70 |
| Oct. | 33.03 | 33.40 | 33.29 | 33.31 |
| Dec. | 32.95 | 33.36 | 33.24 | 33.24 |

## *Closing Rubber Prices on New York Commodity Exchange*
***(No. 1 R.S.S. Contract)***

FROM JUNE 8 TO JULY 6

| June | Spot | July | Sept. | Dec. | Mar. | Sales |
|---|---|---|---|---|---|---|
| 8 | 33.50 | 33.00 | 31.10 | 29.45 | 27.80 | 110 |
| 9 | 33.50 | 31.90 | 29.90 | 28.35 | 27.00 | 190 |
| 10 | —— | —— | —— | —— | —— | —— |
| 11 | —— | —— | —— | —— | —— | —— |
| 12 | 32.75 | 29.90 | 27.90 | 26.35 | 25.00 | 213 |
| 13 | 28.50 | 27.90 | 25.90 | 24.35 | 23.00 | 390 |
| 14 | 28.75 | 28.00 | 26.15 | 24.80 | 23.45 | 205 |
| 15 | 28.75 | 28.20 | 26.50 | 25.45 | 24.00 | 211 |
| 16 | 29.75 | 28.40 | 26.40 | 25.15 | 23.80 | 170 |
| 17 | —— | —— | —— | —— | —— | —— |
| 18 | —— | —— | —— | —— | —— | —— |
| 19 | 29.25 | 28.30 | 26.20 | 25.01 | 23.55 | 102 |
| 20 | 29.00 | 28.10 | 25.85 | 24.55 | 23.25 | 276 |
| 21 | 29.00 | 28.25 | 25.98 | 24.71 | 23.49 | 74 |
| 22 | 29.00 | 27.25 | 25.10 | 23.75 | 22.50 | 269 |
| 23 | 28.75 | 27.25 | 25.05 | 23.75 | 22.50 | 172 |
| 24 | —— | —— | —— | —— | —— | —— |
| 25 | —— | —— | —— | —— | —— | —— |
| 26 | 28.50 | 29.25 | 27.00 | 25.75 | 24.50 | 162 |
| 27 | 31.50 | 31.25 | 29.00 | 27.75 | 26.50 | 408 |
| 28 | 32.00 | 30.75 | 28.20 | 26.80 | 25.25 | 215 |
| 29 | 31.25 | 31.00 | 28.21 | 26.82 | 25.25 | 158 |
| 30 | 31.38 | 30.70 | 27.50 | 26.25 | 25.00 | 219 |
| July | | | | | | |
| 1 | —— | —— | —— | —— | —— | —— |
| 2 | —— | —— | —— | —— | —— | —— |
| 3 | 30.75 | 30.85 | 27.50 | 26.15 | 24.75 | 87 |
| 4 | —— | —— | —— | —— | —— | —— |
| 5 | 30.75 | 31.80 | 28.30 | 26.78 | 25.30 | 64 |
| 6 | 32.50 | 33.70 | 30.05 | 28.35 | 26.80 | 158 |

D P R*

*Trade Mark

**DEPOLYMERIZED RUBBERS**

Produced in a range of flowable consistencies

Uniform Quality

Laboratory Controlled

**Samples and data upon request**

**H. V. HARDMAN CO.**

INCORPORATED

571 Cortlandt St., Belleville 9, N. J.

**BETTER**

**yes, it's grit and impurity free**

**WHITE**

**black, or any color you wish**

**TEAR**

**the tear resistance of No. 1 Smoked Sheets can be *doubled* with**

**Wyandotte Ultra-fine Precipitated Calcium Carbonate (or PURECAL—our new name for this chemical)**

**WYANDOTTE CHEMICALS CORPORATION**

WYANDOTTE, MICHIGAN • OFFICES IN PRINCIPAL CITIES

Wyandotte

REG. U. S. PAT. OFF.

Largest Conveyor Belt Press in the World

35' by 9'—total pressure 7800 tons

**G. Siempelkamp & Co., Maschinenfabrik, Krefeld, (Germany)**

# STATISTICS *Of Interest to the Rubber Industry*

## U. S. Imports and Re-Exports of Natural Rubber

| | GROSS IMPORTS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Natural Rubber (Dry) | | | Natural Rubber (Latex) | | | Guayule | | | | RE-EXPORTS | | TOTAL NET IMPORTS |
| Year | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Long Tons | Total Declared Value | Average Declared Value per pound Cents | Total Gross Imports Long Tons | Long Tons | Total Declared Value | Long Tons |
| 1936 | 467,064 | 152,072,496 | 14.54 | 19,852 | 6,659,899 | 14.98 | 1,229 | 286,552 | 10.41 | 488,145 | 12,581 | 4,488,223 | 475,564 |
| 1937 | 574,600 | 237,307,041 | 18.44 | 23,185 | 10,213,670 | 19.67 | 2,694 | 745,873 | 12.36 | 600,479 | 7,902 | 3,385,433 | 592,577 |
| 1938 | 397,640 | 125,373,864 | 14.08 | 11,944 | 4,168,127 | 15.58 | 2,508 | 628,886 | 11.19 | 412,092 | 5,652 | 1,799,124 | 406,440 |
| 1939 | 469,946 | 167,586,780 | 15.92 | 27,437* | 10,467,552 | 17.03 | 2,233 | 463,345 | 9.27 | 499,616 | 13,125 | 5,832,618 | 486,491 |
| 1940 | 781,202 | 303,308,823 | 17.33 | 33,789 | 14,593,466 | 19.28 | 3,633* | 758,007 | 9.31 | 818,624 | 7,060 | 3,197,136 | 811,564 |
| 1941 | 989,498 | 401,976,317 | 18.14 | 34,797* | 15,965,627 | 20.48 | 4,881 | 1,145,767 | 10.48 | 1,029,176 | 5,376 | 2,757,872 | 1,023,800 |
| 1942 | 266,276 | 112,537,426 | 18.87 | 10,646 | 5,630,667 | 23.61 | 5,523 | 1,660,792 | 13.42 | 282,445 | 10,856 | 5,913,386 | 271,589 |
| 1943 | 50,358 | 31,369,198 | 27.81 | 1,890 | 1,312,202 | 31.00 | 7,678* | 3,636,789 | 21.14 | 59,926 | 22,583 | 16,446,707 | 37,343 |
| 1944 | 103,847 | 73,908,549 | 31.77 | 3,091 | 2,092,211 | 30.99 | 6,701* | 3,351,233 | 22.33 | 113,639 | 9,739 | 8,712,695 | 103,900 |
| 1945 | 134,408 | 95,814,102 | 31.82 | 4,733 | 3,115,853 | 30.22 | 10,040 | 5,963,797 | 26.52 | 149,221 | 9,509 | 7,201,746 | 139,712 |
| 1946 | 366,415 | 222,552,939 | 27.12 | 8,421 | 5,843,085 | 29.14 | 5,344 | 2,859,246 | 23.89 | 380,180 | 7,711 | 5,331,954 | 372,469 |
| 1947 | 691,087 | 306,951,814 | 19.83 | 17,342 | 9,787,722 | 30.98 | 2,884 | 1,492,825 | 23.11 | 711,513 | 4,121 | 2,354,494 | 707,392 |
| 1948 | 702,293 | 290,849,177 | 18.49 | 32,745 | 9,820,080 | 24.93 | 302 | 71,330 | 10.53 | 735,340 | 6,672 | 3,259,324 | 728,668 |
| 1949 | 630,818 | 225,341,459 | 15.93 | 29,974 | 14,970,478 | 22.30 | .... | ..... | .... | 660,792 | 6,253 | 2,746,109 | 654,539 |
| **1948:** | | | | | | | | | | | | | |
| **Oct.** | **58,300** | **26,161,356** | **20.03** | **2,728** | **1,574,419** | **25.83** | .... | ..... | .... | 61,028 | 675 | 320,570 | 60,353 |
| Nov. | 49,800 | 22,292,055 | 19.98 | 813 | 466,095 | 25.59 | .... | ..... | .... | 50,613 | 772 | 349,315 | 49,841 |
| **Dec.** | **83,419** | **35,495,327** | **19.00** | **4,216** | **2,366,959** | **24.75** | .... | ..... | .... | 87,635 | 569 | 250,540 | **87,066** |
| **1949:** | | | | | | | | | | | | | |
| **Jan.** | **66,575** | **27,037,698** | **18.13** | **1,132** | **634,165** | **25.02** | .... | ..... | .... | **67,707** | **757** | **320,036** | **66,950** |
| **Feb.** | **55,234** | **21,549,791** | **17.41** | **2,159** | **1,030,107** | **21.30** | .... | ..... | .... | **57,393** | **434** | **211,323** | **56,959** |
| **Mar.** | **53,768** | **20,095,422** | **16.68** | **2,809** | **1,564,383** | **24.87** | .... | ..... | .... | **56,577** | **562** | **245,780** | **56,015** |
| Apr. | 48,262 | 18,167,840 | 16.85 | 2,271 | 1,219,404 | 23.97 | .... | ..... | .... | 50,533 | 315 | 165,632 | 50,218 |
| May | 51,243 | 18,827,018 | 16.40 | 2,191 | 1,105,887 | 22.54 | .... | ..... | .... | 53,434 | 390 | 181,457 | 53,044 |
| June | 49,038 | 18,084,566 | 16.47 | 2,180 | 1,113,169 | 22.80 | .... | ..... | .... | 51,218 | 471 | 226,882 | 50,747 |
| July | 43,474 | 15,502,688 | 15.76 | 2,267 | 1,146,784 | 22.59 | .... | ..... | .... | 45,741 | 699 | 289,896 | 45,042 |
| Aug. | 46,853 | 15,828,526 | 15.08 | 2,725 | 1,342,109 | 21.98 | .... | ..... | .... | 49,578 | 251 | 110,368 | 49,327 |
| Sept. | 43,476 | 14,069,331 | 14.45 | 2,144 | 1,095,225 | 22.81 | .... | ..... | .... | 45,620 | 556 | 248,921 | 45,064 |
| Oct. | 44,651 | 14,678,475 | 14.66 | 2,634 | 1,213,360 | 20.57 | .... | ..... | .... | 47,285 | 404 | 160,047 | 46,881 |
| Nov. | 63,641 | 20,693,593 | 14.51 | 3,512 | 1,645,360 | 20.89 | .... | ..... | .... | 67,153 | 11 | 9,002 | 67,142 |
| Dec. | 63,982 | 20,770,607 | 14.49 | 3,952 | 1,860,525 | 21.02 | .... | ..... | .... | 67,934 | 689 | 295,362 | 67,245 |
| 1950: | | | | | | | | | | | | | |
| Jan. | 54,277 | 17,881,882 | 14.71 | 3,974 | 1,951,793 | 21.92 | .... | ..... | .... | 58,251 | 431 | 225,196 | 57,820 |
| Feb. | 50,022 | 17,373,658 | 15.51 | 3,336 | 1,608,163 | 21.52 | .... | ..... | .... | 53,358 | 558 | 252,013 | 52,800 |
| Mar. | 57,831 | 21,120,732 | 16.30 | 3,650 | 1,826,747 | 22.34 | .... | ..... | .... | 61,481 | 659 | 326,688 | 60,822 |

Source: U. S. Department of Commerce. * Adjusted to agree with total gross imports.

Notes: (1) Figures for latex are on a dry weight basis. (2) Figures for re-exports include natural rubber (dry and latex) and guayule. (3) In the years 1940 through 1943, crepe sole rubber imports were reported under a separate classification. Such imports, which are included under natural rubber, dry above, were: 856,294 pounds, valued at $191,097 in 1940; 379,607 pounds, valued at $85,924 in 1941; 662,503 pounds, valued at $159,530 in 1942; and 21,653 pounds, valued at $5,215 in 1943.

## Natural Rubber
### (Including Latex and Guayule)

*(All Quantities in Long Tons)*

| Year | New Supply | Consumption | Re-Exports | Stocks On Hand at End of Period |
|---|---|---|---|---|
| **1936** | **488,145** | **575,000** | **12,581** | **223,000** |
| **1937** | **600,479** | **543,600** | **7,902** | **262,204** |
| **1938** | **411,983** | **437,031** | **5,652** | **231,500** |
| **1939** | **499,473** | **592,000** | **13,125** | **125,800** |
| **1940** | **818,243** | **648,500** | **7,060** | **288,864** |
| **1941** | **1,029,007** | **775,000** | **5,376** | **533,344** |
| **1942** | **282,653** | **376,791** | **10,856** | **422,714** |
| **1943** | **55,329** | **317,634** | **20,815** | **139,594** |
| **1944** | **107,834** | **144,113** | **9,665** | **93,650** |
| **1945** | **135,672** | **105,429** | **6,743** | **118,715** |
| **1946** | **400,687** | **277,597** | **4,338** | **237,467** |
| **1947** | **688,354** | **562,661** | **4,101** | **129,038** |
| **1948** | **735,227** | **627,332** | **6,673** | **141,541** |
| 1949 | 660,792 | 574,522 | 6,253 | 106,619 |
| **1948:** | | | | |
| **Oct.** | **61,027** | **49,617** | **675** | **118,187** |
| Nov. | 50,671 | 51,632 | 746 | 113,251 |
| **Dec.** | **87,634** | **45,985** | **569** | **141,541** |
| **1949:** | | | | |
| **Jan.** | **67,706** | **50,188** | **757** | **125,050** |
| **Feb.** | **57,401** | **46,285** | **434** | **118,803** |
| **Mar.** | **56,577** | **53,108** | **562** | **117,664** |
| Apr. | 50,533 | 47,859 | 315 | 112,916 |
| **May** | **53,510** | **46,128** | **390** | **111,875** |
| June | 51,218 | 47,117 | 471 | 103,626 |
| July | 46,277 | 40,597 | 699 | 103,017 |
| Aug. | 49,579 | 45,307 | 251 | 99,850 |
| Sept. | 45,620 | 43,978 | 556 | 100,618 |
| Oct. | 47,285 | 51,243 | 404 | 90,733 |
| Nov. | 67,152 | 52,093 | 701 | 99,208 |
| Dec. | 67,934 | 52,919 | 713 | 106,619 |
| 1950: | | | | |
| Jan. | 58,251 | 59,992 | 431 | 108,769 |
| Feb. | 53,393 | 56,580 | 558 | 104,477 |
| Mar. | 61,481 | 60,859 | 659 | 101,691 |
| Apr. | 76,998 | 57,914 | 639 | 106,124 |
| May | 60,187 | 63,641 | 593 | 101,079 |

**Source: 1936-40, U. S. Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.**

## U.S. Gross Imports of Balata, Jelutong, Gutta-Percha, etc.

*(All Quantities in Long Tons)*

| | Balata | | Jelutong | | Gutta-Percha & Other Guttas | |
|---|---|---|---|---|---|---|
| Year | Tons | Value | Tons | Value | Tons | Value |
| 1936 | 535 | 199,368 | 6,163 | 1,296,364 | 1,568 | 555,643 |
| 1937 | 354 | 151,344 | 7,109 | 2,017,786 | 1,122 | 440,894 |
| 1938 | 509 | 181,140 | 9,132 | 2,944,504 | 444 | 204,582 |
| 1939 | 694 | 265,553 | 6,640 | 1,603,418 | 1,740 | 539,255 |
| 1940 | 648 | 300,500 | 7,451 | 2,449,137 | 2,340 | 1,004,885 |
| 1941 | 924 | 489,514 | 8,821 | 2,954,001 | 1,783 | 607,025 |
| 1942 | 1,544 | 1,107,059 | 1,200 | 530,296 | 804 | 525,763 |
| 1943 | 1,047 | 708,701 | 35 | 14,840 | .... | ..... |
| 1944 | 1,012 | 660,805 | 86 | 45,578 | 10 | 4,999 |
| 1945 | 1,361 | 907,253 | .... | ..... | 36 | 21,970 |
| 1946 | 2,281 | 2,233,065 | 304 | 256,169 | 423 | 458,064 |
| 1947 | 1,982 | 2,276,531 | 2,878 | 1,496,887 | 392 | 779,591 |
| 1948 | 1,195 | 805,078 | 3,401 | 2,377,765 | 423 | 542,788 |
| 1949 | 1,391 | 814,554 | 1,043 | 834,978 | 197 | 189,021 |
| **1948:** | | | | | | |
| Sept. | 91 | 67,970 | 112 | 83,432 | 0 | 0 |
| Oct. | 83 | 67,726 | 145 | 181,424 | 0 | 0 |
| Nov. | 86 | 49,155 | 48 | 36,634 | 20 | 10,572 |
| Dec. | 83 | 56,896 | 106 | 108,975 | 24 | 12,324 |
| 1949: | | | | | | |
| Jan. | 46 | 29,922 | 91 | 93,738 | 19 | 11,934 |
| Feb. | 65 | 53,665 | 77 | 91,362 | 9 | 16,328 |
| Mar. | 136 | 86,499 | 60 | 52,313 | 5 | 30,967 |
| Apr. | 88 | 48,244 | 14 | 8,753 | 16 | 9,878 |
| May | 103 | 60,361 | 85 | 83,291 | .... | ..... |
| June | 44 | 20,821 | 74 | 47,515 | 27 | 16,292 |
| July | 164 | 78,112 | 46 | 37,403 | 5 | 3,391 |
| Aug. | 137 | 66,002 | 114 | 96,509 | 5 | 2,218 |
| Sept. | 208 | 122,732 | 91 | 74,605 | 22 | 31,672 |
| Oct. | 222 | 142,538 | 123 | 92,681 | 19 | 15,221 |
| Nov. | 77 | 68,678 | 160 | 89,806 | 34 | 28,559 |
| Dec. | 54 | 36,980 | 108 | 67,002 | 39 | 24,061 |
| 1950: | | | | | | |
| Jan. | 61 | 42,855 | 37 | 18,308 | 56 | 35,288 |
| Feb. | 42 | 24,040 | 162 | 123,570 | 30 | 20,291 |
| Mar. | 90 | 66,374 | 113 | 97,008 | 17 | 13,672 |

**Source: U. S. Department of Commerce.**

**THE SOUTH ASIA CORP.**

Importers-Dealers Crude Rubber
11 BROADWAY, NEW YORK, N. Y.
Digby 4-2050

BROADSTREET BANK BLDG.
TRENTON 8, NEW JERSEY
TRenton 2-8519

•

CRUDE RUBBER

Synthetic Rubber
Liquid Latex

•

**E. P. LAMBERT CO.**
FIRST NATIONAL TOWER
AKRON 8, OHIO
Hemlock 2188

*High Quality*

*Uniform*

| | |
|---|---|
| PINE TARS | PINE TAR OIL |
| BURGUNDY PITCH | SOLVENTS |
| ROSIN OILS | PINE OIL |
| TACKIFIERS | DIPENTENE |

**E. W. COLLEDGE**
GENERAL SALES AGENT, INC.

P. O. Box 389
Jacksonville, Fla.

52 Vanderbilt Ave.
New York 17, N. Y.

807 National City Bank Bldg.
Cleveland 14, Ohio

25 E. Jackson Blvd.
Chicago 4, Ill.

503 Market St.
San Francisco 5, Cal.

AN IMPORTANT ANNOUNCEMENT

Alco Oil & Chemical Corporation is now in a position to supply you with

**VULCARITES**

COMPOUNDING DISPERSIONS OF RUBBER CHEMICALS

VULCARITES are supplied as individual dispersions of zinc oxide, sulfur, antioxidants and accelerators. Composite dispersions of these chemicals are also available.

Inquiries on special dispersions formulated to definite specifications are invited.

★ ★ ★

Samples and technical service available promptly on request.

**ALCO OIL & CHEMICAL CORPORATION**
TRENTON AVE. and WILLIAM ST., PHILADELPHIA 34, PA.

SOUTHERN DISTRIBUTORS
WICA COMPANY INC.
CHARLOTTE, N.C.

## Synthetic Rubber—Totals

### (GR-S, Neoprene, Butyl, and Buna N Types)

*(All Quantities in Long Tons)*

| Year | Production | Imports | Consumption | Exports | Stocks On Hand at End of Period |
|---|---|---|---|---|---|
| 1941 | 8,383 | ..... | 6,259 | 572 | 1,702 |
| 1942 | 22,434 | ..... | 17,651 | 1,419 | 4,612 |
| 1943 | 231,722 | ..... | 170,891 | 18,148 | 41,568 |
| 1944 | 762,630 | 11,043 | 566,670 | 104,266 | 142,927 |
| 1945 | 820,373 | 10,407 | 693,580 | 83,778 | 203,454 |
| 1946 | 740,026 | 7,709 | 761,699* | 72,920 | 114,963 |
| 1947 | 508,702 | 1,093 | 559,566 | 11,385 | 62,366 |
| 1948 | 488,343 | 15,671 | 442,072 | 4,874 | 115,111 |
| 1949 | 393,690 | 17,242 | 390,855 | 6,483 | 98,042 |
| 1949: | | | | | |
| Sept. | 30,878 | 2,086 | 32,443 | 415 | 110,848 |
| Oct. | 28,015 | 1,497 | 33,687 | 420 | 103,955 |
| Nov. | 28,619 | 1,707 | 31,684 | 459 | 101,430 |
| Dec. | 27,234 | 1,578 | 32,277 | 352 | 98,205 |
| 1950: | | | | | |
| Jan. | 22,178 | 1,659 | 33,966 | 546 | 92,284 |
| Feb. | 29,336 | 2,035 | 31,860 | 577 | 88,381 |
| Mar. | 33,003 | 2,569 | 36,647 | 621 | 86,824 |
| Apr. | 34,821 | 2,302 | 38,075 | 711 | 83,440 |
| May | 37,320 | 2,762 | 46,369 | 614 | 74,672 |

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures shown include the output of both government and privately-owned plants. (3) Figures for 1941 are estimated. * Includes year-end adjustment of 5,384 tons to cover non-reporting companies.

## Synthetic Rubber—By Type

*(All Quantities in Long Tons)*

### New Supply

| | GR-S (Buna S) | GR-M (Neoprene) | GR-I (Butyl) | Buna N Types | Total |
|---|---|---|---|---|---|
| 1942 | 3,721 | 8,956 | 23 | 9,734 | 22,434 |
| 1943 | 182,259 | 33,603 | 1,373 | 14,487 | 231,722 |
| 1944 | 679,949 | 56,660 | 20,252 | 16,812 | 773,673 |
| 1945 | 724,859 | 43,672 | 52,378 | 7,871 | 830,780 |
| 1946 | 613,408 | 47,766 | 80,823 | 5,738 | 747,735 |
| 1947 | 408,858 | 31,495 | 62,824 | 6,618 | 509,795 |
| 1948 | 405,492 | 34,848 | 56,662 | 7,012 | 504,014 |
| 1949 | 310,599 | 35,215 | 54,046 | 11,072 | 410,932 |

### Consumption

| | | | | | |
|---|---|---|---|---|---|
| 1942 | 2,579 | 6,833 | 22 | 8,217 | 17,651 |
| 1943 | 131,977 | 26,205 | 304 | 12,405 | 170,891 |
| 1944 | 495,552 | 46,243 | 10,763 | 14,112 | 566,670 |
| 1945 | 600,145 | 42,394 | 43,012 | 8,029 | 693,580 |
| 1946 | 632,126 | 44,357 | 79,228 | 5,988 | 761,699 |
| 1947 | 448,589 | 37,703 | 68,838 | 4,536 | 559,666 |
| 1948 | 345,313 | 32,118 | 58,870 | 5,771 | 442,072 |
| 1949 | 299,420 | 31,753 | 50,855 | 8,827 | 390,855 |

### Exports

| | | | | | |
|---|---|---|---|---|---|
| 1942 | 222 | 1,037 | .. | 160 | 1,419 |
| 1943 | 14,937 | 2,540 | 46 | 631 | 18,148 |
| 1944 | 98,380 | 4,799 | 530 | 557 | 104,266 |
| 1945 | 76,555 | 5,837 | 980 | 406 | 83,778 |
| 1946 | 68,763 | 2,642 | 495 | 797 | 72,697 |
| 1947 | 7,951 | 2,617 | 62 | 755 | 11,385 |
| 1948 | 1,093 | 2,875 | 21 | 885 | 4,874 |
| 1949 | 1,401 | 3,330 | 178 | 1,574 | 6,483 |

### Stocks at End of Period

| | | | | | |
|---|---|---|---|---|---|
| 1942 | 1,050 | 1,786 | 4 | 1,772 | 4,612 |
| 1943 | 30,975 | 6,415 | 1,033 | 3,145 | 41,568 |
| 1944 | 116,130 | 11,739 | 9,892 | 5,166 | 142,927 |
| 1945 | 170,571 | 9,703 | 18,378 | 4,802 | 203,454 |
| 1946 | 81,483 | 10,470 | 19,478 | 3,755 | 115,186 |
| 1947 | 40,606 | 5,237 | 13,184 | 3,339 | 62,366 |
| 1948 | 96,282 | 5,072 | 10,995 | 2,762 | 115,111 |
| 1949 | 77,731 | 4,654 | 12,224 | 3,433 | 98,042 |

Source: Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (2) Figures for GR-M and Buna N Types include production of privately-owned plants.

## Gasoline Consumption

*(In Thousands of Barrels of 42 Gallons)*

| | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 |
|---|---|---|---|---|---|---|---|---|
| Jan. | 36,085 | 47,540 | 52,008 | 51,746 | 57,057 | 61,308 | 63,083 | 66,908 |
| Feb. | 36,274 | 47,754 | 48,856 | 47,654 | 50,551 | 56,487 | 57,934 | 63,366 |
| Mar. | 41,586 | 52,263 | 55,364 | 56,703 | 59,947 | 68,171 | 73,118 | 78,739 |
| Apr. | 48,177 | 50,005 | 59,024 | 62,111 | 64,140 | 72,183 | 75,279 | 80,348 |
| May | 49,828 | 54,230 | 60,748 | 66,800 | 70,865 | 77,186 | 81,622 | ..... |
| June | 53,325 | 54,266 | 60,580 | 63,247 | 71,329 | 78,044 | 83,338 | ..... |
| July | 49,867 | 55,119 | 66,170 | 60,076 | 73,441 | 81,428 | 82,118 | ..... |
| Aug. | 51,880 | 55,618 | 70,058 | 66,729 | 72,089 | 80,351 | 84,632 | ..... |
| Sept. | 49,707 | 56,318 | 64,529 | 62,268* | 71,384 | 76,159 | 80,760 | ..... |
| Oct. | 53,111 | 53,154 | 55,708 | 66,637 | 73,277 | 75,164 | 79,253 | ..... |
| Nov. | 50,703 | 54,967 | 53,543 | 61,345 | 64,158 | 72,560 | 76,270 | ..... |
| Dec. | 48,695 | 52,250 | 49,745 | 61,101 | 67,506 | 72,162 | 75,470 | ..... |
| Total | 568,238 | 633,482 | 696,333 | 735,417 | 795,015 | 871,270 | 912,877 | ..... |

Source: U. S. Bureau of Mines.

## Reclaimed Rubber

### (Including Natural and Synthetic)

*(All Quantities in Long Tons)*

| Year | Production | Consumption Tons | Consumption % to Crude | Exports | Stocks On Hand at End of Period |
|---|---|---|---|---|---|
| 1936 | 150,571 | 141,486 | 24.6 | 7,085 | 19,000 |
| 1937 | 185,033 | 162,000 | 29.8 | 13,233 | 28,800 |
| 1938 | 122,400 | 120,800 | 27.6 | 7,403 | 23,000 |
| 1939 | 186,000 | 170,000 | 28.7 | 12,611 | 25,250 |
| 1940 | 208,971 | 190,244 | 29.3 | 11,347 | 32,636 |
| 1941 | 274,202 | 251,231 | 32.2 | 13,851 | 41,750 |
| 1942 | 286,007[b] | 254,820 | 64.6 | 30,405 | 42,532 |
| 1943 | 304,058[c] | 291,082 | 59.6 | 15,678 | 46,201 |
| 1944 | 260,631[d] | 251,083 | 35.3 | 11,800 | 43,832 |
| 1945 | 243,309 | 241,036 | 30.2 | 13,413 | 28,155 |
| 1946 | 295,612 | 275,410 | 26.5 | 14,461 | 33,666 |
| 1947 | 291,395 | 288,395 | 24.8 | 14,556 | 35,943 |
| 1948 | 266,861 | 261,113 | 24.4 | 11,428 | 32,630 |
| 1949 | 224,029 | 226,679 | 22.5 | 10,637 | 28,263 |
| 1949: | | | | | |
| Apr. | 18,463 | 18,649 | 22.1 | 1,070 | 32,825 |
| May | 18,184 | 18,323 | 22.5 | 887 | 32,326 |
| June | 18,849 | 19,316 | 23.0 | 694 | 30,684 |
| July | 14,626 | 15,966 | 22.6 | 681 | 29,126 |
| Aug. | 17,813 | 19,297 | 24.2 | 612 | 27,526 |
| Sept. | 18,304 | 18,517 | 24.2 | 761 | 26,257 |
| Oct. | 20,683 | 19,638 | 23.3 | 1,107 | 26,619 |
| Nov. | 19,382 | 18,512 | 22.1 | 796 | 27,801 |
| Dec. | 19,723 | 18,210 | 21.5 | 702 | 28,263 |
| 1950: | | | | | |
| Jan. | 19,472 | 20,106 | 21.4 | 902 | 27,319 |
| Feb. | 20,474 | 19,741 | 22.2 | 790 | 27,256 |
| Mar. | 23,137 | 22,151 | 22.5 | 988 | 27,602 |
| Apr. | 22,716 | 21,318 | 22.2 | 982 | 28,352 |
| May | 24,795 | 24,305 | 22.1 | 881 | 27,555 |

Source: 1936-40, Department of Commerce; 1941 to date, Rubber Division, OMD, and Predecessor Agencies.
Notes: (1) These figures are revised from time to time and the latest available issue should be consulted for the most accurate data. (a) Includes natural and synthetic rubber. (b) Includes 893 tons of imports. (c) Includes 67 tons of imports. (d) Includes 21 tons of imports.

## Automobile Production in U. S.

### (Civilian Production Only)

| Year | Passenger Cars | Trucks | Total | Year | Passenger Cars | Trucks | Total |
|---|---|---|---|---|---|---|---|
| 1930 | 2,784,745 | 571,241 | 3,355,986 | 1940 | 3,692,328 | 721,637 | 4,413,965 |
| 1931 | 1,973,090 | 416,648 | 2,389,738 | 1941 | 3,744,500 | 875,381 | 4,619,681 |
| 1932 | 1,135,491 | 235,187 | 1,370,678 | 1942 | 220,814 | 133,083 | 353,897 |
| 1933 | 1,573,512 | 346,545 | 1,920,057 | 1943 | 0 | 4,501 | 4,501 |
| 1934 | 2,177,919 | 575,192 | 2,753,111 | 1944 | 0 | 124,819 | 124,819 |
| 1935 | 3,252,244 | 694,690 | 3,946,934 | 1945 | 83,792 | 313,643 | 397,435 |
| 1936 | 3,669,528 | 781,862 | 4,451,390 | 1946 | 2,148,699 | 930,760 | 3,079,459 |
| 1937 | 3,915,889 | 892,382 | 4,808,271 | 1947 | 3,558,178 | 1,220,634 | 4,778,812 |
| 1938 | 2,000,985 | 485,852 | 2,486,837 | 1948 | 3,909,270 | 1,363,856 | 5,273,126 |
| 1939 | 2,866,796 | 704,308 | 3,571,104 | 1949 | 5,108,841 | 1,123,736 | 6,232,577 |
| 1949: | | | | | | | |
| Jan. | 326,019 | 104,599 | 430,618 | July | 483,261 | 95,348 | 578,609 |
| Feb. | 324,547 | 101,700 | 426,247 | Aug. | 557,370 | 99,850 | 657,220 |
| Mar. | 402,402 | 115,171 | 517,573 | Sept. | 534,493 | 91,389 | 625,882 |
| Apr. | 436,392 | 106,212 | 542,604 | Oct. | 487,891 | 84,704 | 572,595 |
| May | 394,703 | 86,200 | 480,903 | Nov. | 381,951 | 72,749 | 667,881 |
| June | 493,882 | 99,126 | 593,008 | Dec. | 285,930 | 66,688 | 352,618 |
| 1950: | | | | | | | |
| Jan. | 487,824 | 93,323 | 581,147 | July | ..... | ..... | ..... |
| Feb. | 385,361 | 89,971 | 475,332 | Aug. | ..... | ..... | ..... |
| Mar. | 469,618 | 110,843 | 580,461 | Sept. | ..... | ..... | ..... |
| Apr. | 455,193 | 103,850 | 559,043 | Oct. | ..... | ..... | ..... |
| May | 575,518 | 120,963 | 696,481 | Nov. | ..... | ..... | ..... |
| June | ..... | ..... | ..... | Dec. | ..... | ..... | ..... |

Source: Automobile Manufacturers Association.
Note: Figures are based on factory sales. Revisions are made from time to time in these figures and the latest issue should be consulted for accuracy.

## Rim Production

| | 1945 | 1946 | 1947 | 1948 | 1949 |
|---|---|---|---|---|---|
| Passenger Car | 4,504,368 | 15,058,469 | 21,346,004 | 23,842,796 | 27,715,344 |
| Truck & Bus | 6,386,652 | 5,939,244 | 7,737,353 | 6,920,231 | 4,238,174 |
| Agricultural | 1,441,909 | 1,735,992 | 2,633,699 | 3,140,882 | 2,695,430 |
| Earth Mover | 1,308 | 5,520 | 10,610 | 13,330 | 9,895 |
| Total | 12,434,237 | 22,739,225 | 31,727,666 | 33,917,239 | 34,658,843 |

| | 1949 | 1950 | | | | |
|---|---|---|---|---|---|---|
| | Dec. | Jan. | Feb. | Mar. | Apr. | May |
| Passenger Car | 2,312,926 | 2,673,886 | 2,312,926 | 2,368,168 | 2,301,389 | 2,956,585 |
| Truck & Bus | 449,357 | 512,432 | 449,357 | 525,330 | 468,314 | 562,659 |
| Agricultural | 225,703 | 230,092 | 225,703 | 271,077 | 310,142 | 266,483 |
| Earth Mover | 578 | 408 | 578 | 576 | 476 | 1,514 |
| Total | 2,988,564 | 3,416,818 | 2,988,564 | 3,165,151 | 3,080,321 | 3,787,241 |

Source: The Tire & Rim Association, Inc.

Trade Mark

# HEVEATEX
## CORPORATION
### 78 GOODYEAR AVENUE
### MELROSE 76, MASS.

BRANCHES: CHICAGO, ILL. AKRON, O. DETROIT, MICH. LOS ANGELES, CAL.

Natural and Synthetic

Latex and Latex Compounds

*for all purposes*

# Stamford
## "FACTICE" VULCANIZED OIL
(REG. U. S. PAT. OFF.)

Our products are engineered to fill every need in natural and synthetic rubber compounding wherever the use of vulcanized oil is indicated.

We point with pride not only to a complete line of solid Brown, White, "Neophax" and "Amberex" grades, but also our aqueous dispersions and hydro-carbon solutions of "Factice" for use in their appropriate compounds.

Continuing research and development in our laboratory and rigid production control has made us the leader in this field.

The services of our laboratory are at your disposal in solving your compounding problems.

**THE STAMFORD RUBBER SUPPLY CO.**

**STAMFORD, CONN.**

Makers of Stamford "Factice" Vulcanized Oil Since 1900

(Reg. U.S. Pat. Off.)

## Automotive Pneumatic Casings

*(Thousands of Units)*

| | Shipments | | | | | Inventory |
|---|---|---|---|---|---|---|
| | Original Equipment | Replacement | Export | Total | Production | End of Period |
| **1938 (total)** | **11,516** | **30,567** | **1,049** | **43,132** | **40,907** | **8,451** |
| **Passenger Car.** | **10,086** | **27,104** | **580** | **37,770** | **35,789** | **6,937** |
| **Truck and Bus** | **1,430** | **3,463** | **469** | **5,362** | **5,118** | **1,514** |
| **1939 (total)** | **18,208** | **38,022** | **1,279** | **57,509** | **57,613** | **8,665** |
| **Passenger Car.** | **15,742** | **33,471** | **607** | **49,820** | **49,933** | **7,108** |
| **Truck and Bus** | **2,466** | **4,551** | **672** | **7,689** | **7,680** | **1,557** |
| **1940 (total)** | **22,252** | **35,346** | **1,176** | **58,774** | **59,186** | **9,127** |
| **Passenger Car.** | **19,560** | **30,903** | **411** | **50,874** | **50,965** | **7,270** |
| **Truck and Bus** | **2,692** | **4,443** | **765** | **7,900** | **8,221** | **1,857** |
| **1941 (total)** | **24,780** | **39,895** | **1,489** | **66,164** | **61,540** | **4,436** |
| **Passenger Car.** | **19,855** | **34,119** | **586** | **54,560** | **50,392** | **3,165** |
| **Truck and Bus** | **4,925** | **5,776** | **903** | **11,604** | **11,148** | **1,271** |
| **1942 (total)** | **6,680** | **8,872** | **207** | **15,759** | **15,351** | **6,247** |
| **Passenger Car.** | **910** | **2,734** | **38** | **3,682** | **2,790** | **4,432** |
| **Truck and Bus** | **5,770** | **6,138** | **169** | **12,077** | **12,561** | **1,815** |
| **1943 (total)** | **6,128** | **18,547** | **225** | **24,900** | **20,423** | **1,883** |
| **Passenger Car.** | **82** | **10,606** | **71** | **10,759** | **7,620** | **1,132** |
| **Truck and Bus** | **6,046** | **7,941** | **154** | **14,141** | **12,803** | **751** |
| **1944 (total)** | **6,654** | **26,439** | **263** | **33,356** | **33,446** | **2,013** |
| **Passenger Car.** | **208** | **18,330** | **130** | **18,668** | **18,819** | **1,218** |
| **Truck and Bus** | **6,446** | **8,109** | **133** | **14,688** | **14,627** | **795** |
| **1945 (total)** | **5,984** | **36,479** | **504** | **42,967** | **44,524** | **3,077** |
| **Passenger Car.** | **1,115** | **25,463** | **222** | **26,800** | **28,200** | **2,214** |
| **Truck and Bus** | **4,869** | **11,016** | **282** | **16,167** | **16,324** | **863** |
| **1946 (total)** | **15,310** | **65,490** | **1,512** | **82,312** | **82,298** | **2,448** |
| **Passenger Car.** | **11,086** | **54,684** | **653** | **66,423** | **66,466** | **1,763** |
| **Truck and Bus** | **4,224** | **10,806** | **859** | **15,889** | **15,832** | **685** |
| **1947 (total)** | **25,056** | **62,871** | **3,256** | **91,183** | **95,550** | **6,949** |
| **Passenger Car.** | **19,644** | **52,857** | **1,608** | **74,109** | **77,795** | **5,444** |
| **Truck and Bus** | **5,412** | **10,014** | **1,648** | **17,074** | **17,755** | **1,505** |
| **1948 (total)** | **26,845** | **49,148** | **1,787** | **77,781** | **81,314** | **10,698** |
| **Passenger Car.** | **21,589** | **41,295** | **656** | **63,540** | **66,738** | **8,773** |
| **Truck and Bus** | **5,256** | **7,853** | **1,132** | **14,241** | **14,576** | **1,925** |
| 1949 (total) | 31,584 | 43,466 | 1,467 | 76,517 | 76,369 | 10,638 |
| Passenger Car. | 28,129 | 36,440 | 509 | 65,077 | 65,140 | 8,904 |
| Truck and Bus | 3,456 | 7,026 | 958 | 11,440 | 11,228 | 1,734 |
| 1950: | | | | | | |
| Feb. (total) | 3,247 | 2,870 | 100 | 6,216 | 6,691 | 11,797 |
| Passenger Car. | 2,891 | 2,333 | 37 | 5,261 | 5,606 | 9,785 |
| Truck and Bus | 356 | 537 | 63 | 956 | 1,085 | 2,012 |
| Mar. (total) | 2,830 | 3,858 | 106 | 6,794 | 7,314 | 12,355 |
| Passenger Car. | 2,484 | 3,127 | 42 | 5,654 | 6,172 | 10,332 |
| Truck and Bus | 345 | 731 | 64 | 1,140 | 1,142 | 2,022 |
| April (total) | 2,975 | 4,438 | 112 | 7,526 | 7,583 | 12,341 |
| Passenger Car. | 2,648 | 3,695 | 53 | 6,396 | 6,469 | 10,354 |
| Truck and Bus | 327 | 744 | 59 | 1,129 | 1,114 | 1,987 |
| May (total) | 3,119 | 5,296 | 106 | 8,521 | 8,629 | 12,367 |
| Passenger Car. | 2,733 | 4,498 | 46 | 7,277 | 7,369 | 10,365 |
| Truck and Bus | 386 | 798 | 60 | 1,244 | 1,260 | 2,002 |

Source: The Rubber Manufacturers Association, Inc.

## Cotton, Rayon and Nylon Tire Fabrics

*(Production in Thousands of Pounds)*

| | Cotton | | | | Rayon and Nylon[b] | | |
|---|---|---|---|---|---|---|---|
| | Tire Cord Not Woven | Cord Fabric Woven | Chafer and All Other Tire Fabrics | Total | Tire Cord Not Woven | Tire Cord And Other Tire Fabrics | Total |
| **1946:** | | | | | | | |
| **Jan.-Mar.** | **17,128** | **39,377** | **15,245** | **71,750** | *a* | **51,208** | **51,208** |
| **Apr.-June** | **19,622** | **40,197** | **18,623** | **78,442** | *a* | **52,511** | **52,511** |
| **July-Sept.** | **17,279** | **39,259** | **18,787** | **75,325** | **5,102** | **46,932** | **52,034** |
| **Oct.-Dec.** | **20,660** | **42,668** | **21,708** | **85,036** | **5,858** | **50,589** | **56,447** |
| **Total** | **74,689** | **161,501** | **74,363** | **310,553** | **10,960** | **201,240** | **212,200** |
| **1947:** | | | | | | | |
| **Jan.-Mar.** | **21,972** | **49,377** | **21,815** | **93,164** | **5,322** | **52,059** | **57,381** |
| **Apr.-June** | **23,491** | **53,746** | **16,480** | **93,717** | **5,486** | **47,360** | **52,846** |
| **July-Sept.** | **15,571** | **44,291** | **14,596** | **74,458** | **6,161** | **51,719** | **57,880** |
| **Oct.-Dec.** | **18,183** | **48,532** | **17,762** | **84,477** | **6,550** | **55,078** | **61,628** |
| **Total** | **79,217** | **195,946** | **70,653** | **345,816** | **23,519** | **206,216** | **229,735** |
| **1948:** | | | | | | | |
| **Jan.-Mar.** | **18,546** | **50,251** | **19,391** | **88,188** | *a* | **60,569** | **60,569** |
| **Apr.-June** | **15,585** | **45,385** | **18,213** | **79,183** | *a* | **59,759** | **59,759** |
| July-Sept. | 29,743 | 45,927 | *c* | 75,670 | *a* | 63,642 | 63,642 |
| Oct.-Dec. | 13,321 | 34,424 | 15,879 | 63,624 | *a* | 65,258 | 65,258 |
| Total | 77,195 | 175,987 | 53,483 | 306,665 | ..... | 249,228 | 249,228 |
| 1949: | | | | | | | |
| Jan.-Mar. | *d* | 33,213 | 25,395 | 56,608 | *a* | 68,296 | 68,926 |
| Apr.-June | 5,309 | 29,114 | 13,617 | 48.040 | *a* | 68,269 | 68,269 |
| July-Sept. | 1,343 | 16,620 | 11,141 | 29,104 | 15,640 | 55,969 | 71,609 |
| Oct.-Dec. | 180 | 17,650 | 11,886 | 29,716 | 12,967 | 58,890 | 72,857 |
| Total | 6,832 | 96,597 | 62,039 | 163,468 | 28,607 | 251,424 | 281,661 |

**Source: U. S. Bureau of the Census.**
**Notes: (a) Included with tire cord and fabrics to avoid disclosures of operations of individual mills. (b) Fuel cell fabrics are not included with rayon and nylon tire cord and fabrics. (c) Included with tire cord not woven.** (d) Included with chafer and all other tire fabrics.

## Automotive Inner Tubes

*(Thousands of Units)*

| | Shipments | | | | | Inventory |
|---|---|---|---|---|---|---|
| | Original Equipment | Replacement | Export | Total | Production | End of Period |
| 1936 | 21,514 | 32,188 | 721 | 54,423 | 57,036 | 10,945 |
| 1937 | 22,464 | 29,554 | 749 | 52,767 | 52,373 | 10,312 |
| 1938 | 11,515 | 28,134 | 644 | 40,293 | 37,848 | 8,166 |
| 1939 | 18,190 | 31,998 | 1,002 | 51,190 | 50,649 | 7,036 |
| 1940 | 22,172 | 29,070 | 972 | 52,214 | 52,237 | 7,017 |
| 1941 | 24,722 | 33,749 | 1,232 | 59,703 | 57,433 | 4,686 |
| 1942 | 6,895 | 7,213 | 159 | 14,267 | 12,685 | 6,206 |
| 1943 | 6,350 | 12,474 | 189 | 19,014 | 15,014 | 2,626 |
| 1944 | 6,460 | 20,569 | 196 | 27,224 | 27,488 | 2,813 |
| 1945 | 5,988 | 33,906 | 411 | 40,304 | 41,742 | 3,627 |
| 1946 | 15,327 | 59,357 | 1,424 | 76,108 | 77,251 | 3,820 |
| 1947 | 25,046 | 46,560 | 2,483 | 74,088 | 79,181 | 8,059 |
| 1948 | 26,833 | 40,548 | 1,119 | 68,499 | 70,033 | 9,641 |
| 1949 | 31,521 | 31,450 | 887 | 63,858 | 65,114 | 10,657 |
| 1949: | | | | | | |
| Nov. | 1,746 | 2,415 | 55 | 4,216 | 5,155 | 9,645 |
| Dec. | 2,172 | 1,993 | 58 | 4,222 | 5,339 | 10,713 |
| 1950: | | | | | | |
| Jan. | 3,090 | 2,164 | 58 | 5,312 | 5,629 | 10,926 |
| Feb. | 3,245 | 2,307 | 58 | 5,610 | 5,803 | 11,059 |
| Mar. | 2,831 | 2,842 | 61 | 5,733 | 6,223 | 11,432 |
| Apr. | 2,975 | 3,051 | 69 | 6,094 | 6,285 | 11,710 |
| May | 3,116 | 3,517 | 55 | 6,688 | 7,089 | 12,110 |

Source: The Rubber Manufacturers Association, Inc.

## Smoked Sheets—Spot Closing Prices

*(New York Market—Cents per pound)*

| Year | High | Low | Avg. | Year | High | Low | Avg. |
|---|---|---|---|---|---|---|---|
| 1910 | 288 | 141 | 206.60 | 1930 | 16½ | 7½ | 11.98 |
| 1911 | 184 | 114 | 141.30 | 1931 | 8⅝ | 4½ | 6.17 |
| 1912 | 140 | 108 | 121.60 | 1932 | 4¾ | 2½ | 3.49 |
| 1913 | 113 | 59 | 82.04 | 1933 | 9⅞ | 2⅞ | 5.96 |
| 1914 | 93 | 56 | 65.33 | 1934 | 15⅞ | 8¾ | 12.92 |
| 1915 | 79 | 58½ | 65.85 | 1935 | 13¾ | 10½ | 12.37 |
| 1916 | 102 | 55 | 72.50 | 1936 | 23 | 13½ | 16.41 |
| 1917 | 90 | 52 | 72.23 | 1937 | 26⅞ | 14 | 19.39 |
| 1918 | 70 | 40 | 60.15 | 1938 | 17⅞ | 10¼ | 14.64 |
| 1919 | 57 | 38½ | 48.70 | 1939 | 24 | 14½ | 17.57 |
| 1920 | 56½ | 16 | 36.30 | 1940 | 24 | 18¼ | 20.10 |
| 1921 | 21¼ | 11½ | 16.36 | 1941 | 24⅞ | 19½ | 22.40 |
| 1922 | 28⅜ | 13⅜ | 17.50 | 1942 | 22½ | 22½ | 22.50 |
| 1923 | 37⅛ | 24¾ | 29.45 | 1943 | 22½ | 22½ | 22.50 |
| 1924 | 40⅛ | 17⅜ | 26.20 | 1944 | 22½ | 22½ | 22.50 |
| 1925 | 121 | 34⅜ | 72.46 | 1945 | 22½ | 22½ | 22.50 |
| 1926 | 88½ | 36¾ | 48.50 | 1946 | 22½ | 22½ | 22.50 |
| 1927 | 41¾ | 33 | 37.72 | 1947 | 25 | 14 | 20.00 |
| 1928 | 41¼ | 17 | 22.48 | 1948 | 25 | 18 | 21.99 |
| 1929 | 26⅞ | 15½ | 20.55 | 1949 | 19¾ | 15⅞ | 17.57 |

Note: Price was fixed by Government on August 6, 1941, at 22½c a pound for non-war uses. Free trading was resumed May 1, 1947.

## Spot Closing Cotton Prices

*(Middling Upland Grade—New York Market—in Cents)*

**Average Monthly Price Per Pound**

| | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 | 1949 | 1950 |
|---|---|---|---|---|---|---|---|---|
| Jan. | 21.34 | 20.76 | 22.36 | 25.49 | 32.58 | 36.09 | 33.37 | 31.89 |
| Feb. | 21.61 | 21.34 | 22.29 | 26.57 | 33.91 | 33.63 | 33.41 | 32.79 |
| Mar. | 21.98 | 21.65 | 22.43 | 27.52 | 35.89 | 35.04 | 33.44 | 32.65 |
| Apr. | 22.02 | 21.71 | 21.88 | 28.40 | 35.89 | 38.10 | 33.84 | 33.23 |
| May | 21.97 | 21.63 | 23.30 | 28.17 | 36.51 | 38.57 | 33.73 | 33.64 |
| June | 21.92 | 23.31 | 23.42 | 29.89 | 37.83 | 38.12 | 33.56 | 34.61 |
| July | 21.46 | 22.33 | 23.27 | 34.11 | 38.03 | 34.89 | 32.99 | .... |
| Aug. | 21.09 | 22.11 | 23.10 | 36.31 | 34.83 | 32.23 | 32.06 | .... |
| Sept. | 21.10 | 22.10 | 23.25 | 37.59 | 32.21 | 31.92 | 30.94 | .... |
| Oct. | 21.00 | 22.32 | 23.85 | 36.79 | 32.39 | 32.01 | 30.32 | .... |
| Nov. | 20.32 | 22.13 | 24.71 | 31.50 | 34.50 | 32.15 | 30.52 | .... |
| Dec. | 20.32 | 22.28 | 25.21 | 33.03 | 36.74 | 32.90 | 31.08 | .... |
| Average for Year | 21.34 | 21.89 | 23.25 | 31.28 | 35.11 | 34.64 | 32.44 | .... |

## Consumption of Vinyl Resins

*(In Thousands of Pounds)*

| | Sheeting and Film[a] | Textile and Paper Coating Resins[b] | Molding and Extrusion Materials[b] | All Other[b, c] |
|---|---|---|---|---|
| 1946 | 52,080 | 11,673 | 61,852 | 27,083 |
| 1947 | 66,430 | 17,237 | 73,114 | 27,064 |
| **1948** | **98,021** | **31,085** | **73,598** | **21,147** |
| 1949 | 157,544 | 29,470 | 81,842 | 19,792 |
| 1950: | | | | |
| Jan. | 16,467 | 3,507 | 9,756 | 2,182 |
| Feb. | 17,771 | 3,097 | 7,683 | 1,637 |
| Mar. | 20,676 | 3,990 | 9,533 | 1,989 |
| Apr. | 18,675 | 4,076 | 9,513 | 2,068 |

Source: Bureau of the Census.
Notes: (a) Includes weight of fillers, plasticizers, extenders and safety glass sheeting; (b) Resin content; (c) Includes Adhesives, but excludes data for protective coating resins.

# Clark ALUMINUM TREAD TRAY TRUCK

## OFFERS YOU MOST

### *Helps Stop Tire Thump*

The all aluminum trays will prevent stretch and shrink. Keep stock cleaner.

Hard aluminum trays require no bracing, will not pitt or scale.

More shelves per truck with less weight.

Clark Aluminum Leaf Trucks in use over five years without a tray failure.

Comes in both one and two sides, sizes to fit your production requirements.

A trial will convince that the Clark Aluminum Leaf Truck production savings will equal their cost in a short time.

*Write for Descriptive Literature*

**All Steel Welded Truck Co.**
Rockford, Illinois

# A LOW COST BUNA N PLASTICIZER
## PANAFLEX BN-1
### EXCELLENT FOR Light Colored PRODUCTS!

**PANAFLEX BN-1** is an economical, light-colored plasticizer for synthetic rubber — especially butadiene-acrylonitrile type.

This new hydrocarbon plasticizer *completely* replaces dibutyl phthalate in nitrile rubbers — produces soft vulcanizates having high tensile, excellent elongation, and very low modulus. **PANAFLEX BN-1** plasticized stocks possess good ageing properties, superior electrical characteristics, and show good gasoline and oil resistance.

| | |
|---|---|
| SPECIFY GRAVITY | 0.9440 |
| COLOR, NPA | 1½ |
| REFRACTIVE INDEX | 1.553 |
| DISTILLATION, °F | 560-730 |
| ODOR | Excellent |
| VISCOSITY, SSU @ 100°F | 240 |

*SAMPLES ON REQUEST*

PAN AMERICAN DIVISION Pan American Refining Corp. Chemicals

122 East 42nd Street, New York 17, N. Y. — PAN AMERICAN — Plant Texas City, Texas

# Rubber Industry Employment, Wages and Hours

## All Rubber Products

| Mo. | 1949 Production Workers (thousands) | 1949 Average Weekly Earnings | 1949 Average Weekly Hours | 1949 Average Hourly Earnings | 1950 Production Workers (thousands) | 1950 Average Weekly Earnings | 1950 Average Weekly Hours | 1950 Average Hourly Earnings |
|---|---|---|---|---|---|---|---|---|
| Jan. | 201 | $56.89 | 37.9 | $1.501 | 187 | $60.52 | 39.4 | $1.536 |
| Feb. | 197 | 56.55 | 37.7 | 1.500 | 187 | 60.94 | 39.7 | 1.535 |
| Mar. | 194 | 55.43 | 37.0 | 1.498 | 187 | 60.17 | 39.3 | 1.531 |
| Apr. | 190 | 55.50 | 36.9 | 1.504 | 189 | 64.75 | 40.7 | 1.591 |
| May | 185 | 57.08 | 37.7 | 1.514 | ... | .... | ... | .... |
| June | 181 | 58.29 | 38.2 | 1.526 | ... | .... | ... | .... |
| July | 177 | 58.37 | 38.4 | 1.520 | ... | .... | ... | .... |
| Aug. | 180 | 57.72 | 38.3 | 1.507 | ... | .... | ... | .... |
| Sept. | 167 | 60.97 | 40.3 | 1.513 | ... | .... | ... | .... |
| Oct. | 187 | 59.57 | 39.4 | 1.512 | ... | .... | ... | .... |
| Nov. | 186 | 57.91 | 38.4 | 1.508 | ... | .... | ... | .... |
| Dec. | 187 | 59.04 | 39.2 | 1.506 | ... | .... | ... | .... |

## Tires and Tubes

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Jan. | 91.3 | 60.72 | 35.3 | 1.720 | 82.6 | 67.70 | 38.4 | 1.763 |
| Feb. | 89.4 | 60.99 | 35.4 | 1.723 | 83.1 | 67.80 | 38.5 | 1.761 |
| Mar. | 88.6 | 61.50 | 35.8 | 1.718 | 83.5 | 66.30 | 37.8 | 1.754 |
| Apr. | 88.6 | 60.92 | 35.4 | 1.721 | ... | .... | ... | .... |
| May | 87.2 | 63.20 | 36.3 | 1.741 | ... | .... | ... | .... |
| June | 86.3 | 64.09 | 36.6 | 1.751 | ... | .... | ... | .... |
| July | 82.0 | 64.45 | 36.6 | 1.761 | ... | .... | ... | .... |
| Aug. | 80.9 | 62.32 | 36.0 | 1.731 | ... | .... | ... | .... |
| Sept. | 64.3 | 70.03 | 39.1 | 1.791 | ... | .... | ... | .... |
| Oct. | 81.1 | 64.83 | 37.3 | 1.738 | ... | .... | ... | .... |
| Nov. | 81.3 | 63.91 | 36.9 | 1.732 | ... | .... | ... | .... |
| Dec. | 82.1 | 64.79 | 37.3 | 1.737 | ... | .... | ... | .... |

## Rubber Footwear

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Jan. | 24.8 | 51.86 | 40.2 | 1.290 | 20.1 | 45.87 | 35.7 | 1.285 |
| Feb. | 22.9 | 48.15 | 37.5 | 1.284 | 17.6 | 47.38 | 37.1 | 1.277 |
| Mar. | 21.9 | 42.07 | 33.6 | 1.252 | 17.9 | 48.96 | 38.1 | 1.285 |
| Apr. | 21.4 | 46.65 | 37.2 | 1.254 | ... | .... | ... | .... |
| May | 20.5 | 49.45 | 38.9 | 1.257 | ... | .... | ... | .... |
| June | 19.8 | 50.35 | 39.4 | 1.278 | ... | .... | ... | .... |
| July | 20.2 | 48.84 | 38.7 | 1.262 | ... | .... | ... | .... |
| Aug. | 20.3 | 48.78 | 38.9 | 1.254 | ... | .... | ... | .... |
| Sept. | 21.1 | 51.71 | 40.4 | 1.280 | ... | .... | ... | .... |
| Oct. | 21.5 | 49.81 | 39.1 | 1.274 | ... | .... | ... | .... |
| Nov. | 22.2 | 50.51 | 39.9 | 1.266 | ... | .... | ... | .... |
| Dec. | 22.1 | 50.23 | 39.8 | 1.262 | ... | .... | ... | .... |

## All Other Rubber Products

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Jan. | 85.3 | 54.38 | 40.2 | 1.356 | 84.5 | 57.04 | 41.3 | 1.381 |
| Feb. | 85.1 | 54.05 | 40.1 | 1.348 | 86.0 | 56.95 | 41.3 | 1.379 |
| Mar. | 83.1 | 52.49 | 39.2 | 1.339 | 86.0 | 56.50 | 41.0 | 1.378 |
| Apr. | 79.6 | 51.69 | 38.4 | 1.346 | ... | .... | ... | .... |
| May | 77.2 | 52.51 | 39.1 | 1.343 | ... | .... | ... | .... |
| June | 75.3 | 53.85 | 39.8 | 1.353 | ... | .... | ... | .... |
| July | 74.5 | 54.11 | 40.2 | 1.346 | ... | .... | ... | .... |
| Aug. | 78.6 | 52.46 | 40.6 | 1.366 | ... | .... | ... | .... |
| Sept. | 81.4 | 56.28 | 41.2 | 1.366 | ... | .... | ... | .... |
| Oct. | 84.4 | 57.06 | 41.5 | 1.375 | ... | .... | ... | .... |
| Nov. | 82.8 | 54.04 | 39.5 | 1.368 | ... | .... | ... | .... |
| Dec. | 82.7 | 55.66 | 40.9 | 1.361 | ... | .... | ... | .... |

Source: U. S. Departments of Commerce and Labor.

Note: Data are based upon reports from cooperating establishments covering both full and part-time employees who worked during or received pay for the pay period ending nearest the 15th of the month. The employment series have been adjusted to levels indicated by Federal Security Agency data for 1947, and have been carried forward from 1947 bench-mark levels, thereby providing consistent series. Hours and earning data pertain only to production and related workers.

# Production Index for the Rubber Industry

## Production 1935-1939 = 100

## (Based on man-hours)

| | 1948 | 1949 | 1950 | | 1948 | 1949 | 1950 |
|---|---|---|---|---|---|---|---|
| Jan. | 223 | 193 | 194 | July | 200 | 175 | ... |
| Feb. | 215 | 188 | 196 | Aug. | 207 | 178 | ... |
| Mar. | 205 | 182 | 195 | Sept. | 205 | 174 | ... |
| Apr. | 200 | 177 | 205 | Oct. | 205 | 192 | ... |
| May | 201 | 178 | ... | Nov. | 203 | 187 | ... |
| June | 205 | 178 | ... | Dec. | 200 | 193 | ... |

Source: U. S. Department of Commerce.

# Sales by the Rubber Industry

## (In Millions of Dollars)

| | 1948 | 1949 | 1950 | | 1948 | 1949 | 1950 |
|---|---|---|---|---|---|---|---|
| Jan. | 271 | 260 | 276 | July | 331 | 271 | ... |
| Feb. | 265 | 251 | 286 | Aug. | 331 | 295 | ... |
| Mar. | 270 | 260 | 306 | Sept. | 317 | 277 | ... |
| Apr. | 285 | 257 | ... | Oct. | 294 | 262 | ... |
| May | 273 | 248 | ... | Nov. | 291 | 262 | ... |
| June | 299 | 266 | ... | Dec. | 280 | 266 | ... |

Source: U. S. Department of Commerce.

# Rubber Manufacturers' Inventories

## (Based upon Book-Value)

## (In Millions of Dollars)

| | 1948 | 1949 | 1950 | | 1948 | 1949 | 1950 |
|---|---|---|---|---|---|---|---|
| Jan. | 608 | 661 | 558 | July | 648 | 625 | ... |
| Feb. | 625 | 661 | 594 | Aug. | 641 | 586 | ... |
| Mar. | 634 | 653 | 595 | Sept. | 661 | 562 | ... |
| Apr. | 625 | 648 | ... | Oct. | 650 | 537 | ... |
| May | 632 | 650 | ... | Nov. | 667 | 587 | ... |
| June | 645 | 644 | ... | Dec. | 650 | 584 | ... |

Source: U. S. Department of Commerce.

# Various Compounding Materials Consumed by the Rubber Industry

| Material | 1943 | 1944 | 1945 | 1946 | 1947 | 1948 | 1949 |
|---|---|---|---|---|---|---|---|
| Asphalt [a] | | | | | | | |
| Short tons | 16,510 | 20,189 | 19,483 | 28,715 | 32,113 | 19,967 | 18,050 |
| % of total | .005 | .006 | .005 | .007 | .007 | .004 | .003 |
| Barite (Barytes): | | | | | | | |
| Short tons | 8,000 | 10,000 | 10,000 | 20,000 | 17,000 | 18,000 | ..... |
| % of total | 3.9 | 2.9 | 2.1 | 4.4 | 3.1 | 2.85 | ... |
| Carbon Black: | | | | | | | |
| Short tons | 236,737 | 369,015 | 402,193 | 470,732 | 471,790 | 424,038 | ..... |
| % of total | 90.3 | 94.6 | 95.5 | 95.3 | 94.3 | 91.0 | ... |
| Clay, Kaolin: | | | | | | | |
| Short tons | 50,964 | 59,588 | 109,936 | 162,393 | 166,201 | 176,965 | 197,341 |
| % of total | 5.5 | 6.8 | 11.7 | 12.3 | 11.5 | 11.3 | 13.1 |
| Clay, Fire & Stoneware: | | | | | | | |
| Short tons | 10,259 | 7,160 | 7,800 | 12,951 | 17,970 | 15,480 | ..... |
| % of total | 0.2 | 0.1 | 0.1 | 0.2 | 0.2 | 0.2 | ... |
| Lead Sulfate, Basic: | | | | | | | |
| Short tons | 131 | 268 | 200 | ... | ... | ... | ... |
| % of total | 2.3 | 4.2 | 5.2 | ... | ... | ... | ... |
| Lime: | | | | | | | |
| Short tons | 2,039 | 5,634 | 7,170 | 3,193 | 589 | 1,154 | ..... |
| % of total | 0.03 | 0.09 | 0.12 | 0.05 | 0.01 | 0.02 | ... |
| Litharge: | | | | | | | |
| Short tons | 4,302 | 3,023 | 1,864 | 2,131 | 2,205 | 2,835 | ..... |
| % of total | 3.8 | 2.2 | 1.3 | 1.6 | 1.3 | 1.8 | ... |
| Lithopone: | | | | | | | |
| Short tons | 1,078 | 726 | 977 | 1,607 | 3,085 | 4,192 | ..... |
| % of total | 0.8 | 0.5 | 0.7 | 1.1 | 1.9 | 3.0 | ... |
| Mica, Ground: | | | | | | | |
| Short tons | 3,063 | 1,137 | 3,715 | 4,951 | 3,900 | 12,275 | ..... |
| % of total | 6.0 | 2.2 | 7.1 | 8.0 | 6.0 | 19.0 | ... |
| Sulfur: | | | | | | | |
| Short tons | 51,000 | 63,000 | 64,960 | 72,800 | 72,800 | 70,560 | ..... |
| % of total | 1.8 | 1.9 | 2.0 | 2.2 | 1.8 | 1.7 | ... |
| Talc [b] | | | | | | | |
| Short tons | 48,994 | 51,833 | 63,758* | 65,980 | 71,840 | 66,226 | ..... |
| % of total | 11.8 | 13.0 | 16.0 | 14.4 | 13.9 | 13.0 | ... |
| Zinc Oxide: | | | | | | | |
| Short tons | 67,898 | 59,518 | 63,447 | 83,776 | 82,248 | 82,895 | ..... |
| % of total | 47.4 | 42.3 | 49.6 | 53.1 | 51.2 | 54.9 | ..... |

Source: U. S. Bureau of Mines.

Notes: (a) Solid and semi-solid products of less than 200 penetration. (b) Includes pyrophyllite and ground soapstone. * Revised.

RMP
for
RED RUBBER

ANTIMONY

• ATTRACTIVE
• NON-DETERIORATING

RARE METAL PRODUCTS CO.
ATGLEN, PA.

RUBBER

CRUDE AND SYNTHETIC

★

Sole Distributor
DUNLOP CENTRIFUGED LATEX
North • South • Central • America

Sole U.S. Distributor
SYNTHETIC LATICES for
POLYMER CORPORATION LTD.
Sarnia, Ont., Canada

AKRON
BOSTON
LOS ANGELES
TORONTO

★

In Mexico:
COMERCIAL TROPICAL, S.A.
Mexico City

CHARLES T. WILSON CO., INC.
120 WALL ST., NEW YORK 5, N. Y.

★

MICA

WATERGROUND WHITE and BIOTITE MICAS — Used for over 40 years in the Rubber Industry

THE ENGLISH MICA COMPANY
STERLING BUILDING, STAMFORD, CONN.

SOFTENERS and PLASTICIZERS
For RUBBER
From the Pine Tree

ROSIN OIL
PINE TAR
BURGUNDY PITCH
GALEX a non-oxidizing RESIN
*Send for* "Pine Tree Products" *Booklet*

NATIONAL ROSIN OIL PRODUCTS, Inc.
R. K. O. BUILDING, RADIO CITY, NEW YORK 20, N. Y.
Plant: Savannah, Ga. Branches in Principal Cities
PIONEERS OF THE INDUSTRY

FINELY PULVERIZED, BRILLIANT
COLORS *for*
RUBBER-VINYLS

*Western Representative:* FRED L. BROOKE CO., 3340 N. Halsted St., Chicago 13, Ill.
*Ohio Representative:* PALMER SUPPLIES CO., 1531 W. 25th St., Cleveland; 800 Broadway, Cincinnati
*San Francisco-Los Angeles:* WITCO CHEMICAL CO.

MANUFACTURED BY
BROOKLYN COLOR WORKS, INC.
MORGAN & NORMAN AVES., BROOKLYN 22, N.Y.

RUBBER STATISTICAL BULLETIN

• Annual Subscription $5.00

The only official world rubber statistics, published monthly by the Secretariat of the Rubber Study Group.

*Exclusive Subscription Agent in the U. S. A.*

RUBBER AGE
250 W. 57th STREET
NEW YORK 19, N. Y.

GUARANTEED
REBUILT MACHINERY

MILLS, CALENDERS,
TUBERS, VULCANIZERS,
PUMPS, ACCUMULATORS,
MIXERS, PULVERIZERS,
HYDRAULIC PRESSES,
CUTTING MACHINES
Immediate Deliveries from Stock

UNITED RUBBER MACHINERY EXCHANGE

183-189 ORATION STREET
NEWARK 4, N. J.
CABLE: "URME"

# CLASSIFIED WANT ADS

**RATES:**
**All Classifications (except Positions Wanted):**
**8c per word in light face type—Minimum, $3.00**
**12c per word in bold face type—Minimum, $3.00**
**Positions Wanted:**
**$1.00 for 40 words or less; extra words, 5c each.**
**When Box Number is used, add 5 words to word count.**

**If heading is to be set on separate line, count it as 10 words if light face type is used, or 8 words if bold type is used.**
**Display or Classified advertisements in borders: $10.00 per column inch; maximum, 85 words per inch.**
**All Classified Advertising must be paid in advance except for advertisers on contract. Send check with copy.**
**Replies to keyed advertisements will be forwarded to advertiser without charge.**

**Address all replies to Box Numbers care of RUBBER AGE, 250 West 57th Street, New York 19, N. Y.**

**Copy for August, 1950, issue, must be received by Tuesday, August 1st.**

## POSITIONS WANTED

RUBBER CHEMIST: B.S., M.S., Chemical Engineering. Ten years excellent background of development in expanded and mechanical items, thoroughly familiar with synthetic and natural rubbers. Seeks responsible position in technical service or development. Age 36, family, available immediately. Address Box 736-P, RUBBER AGE.

PRODUCTION MAN, formerly head of the Molding Department of Pirelli in Belgium, now in this country, seeks opportunity with progressive manufacturer. Extensive experience with drug sundries, plumbers' specialties, light and heavy mechanicals, both natural and synthetic. Also extruding operations. Capable complete supervision of all compounding and processing operations. Salary requirement reasonable. Address Box 737-P, RUBBER AGE.

CHEMIST-SUPERINTENDENT: Over twenty years experience production, management, testing, and compounding natural and synthetic rubber for molded goods and mechanicals—experienced high temperature high speed curing. Can cut your material and manufacturing costs. Available in consulting capacity. Address Box 738-P, RUBBER AGE.

WIRE and CABLE ENGINEER, now employed, desires position in wire and cable engineering or allied field. Address Box 740-P, RUBBER AGE.

**NELSON EMPLOYMENT SERVICE**
**Specialist for "The Rubber Industry"**
**EXECUTIVE — TECHNICAL — SALES — OFFICE**
**No Charge to Employers ● Phone—Write—Wire**
**204/6 Buckeye Bldg. Akron 8, Ohio**
**Phones—Franklin 3197, 1610**
**Harold Nelson, Mgr.**

RUBBER TECHNOLOGIST: M.S., Ch.E. Desires position with progressive company. One year general rubber laboratory experience, two years latex foam research. Veteran, age thirty. Address Box 747-P, RUBBER AGE.

Aggressive Graduate CHEMICAL ENGINEER: Ten years diversified industrial experience: rubber, synthetics, plastics, and colloidal fillers. Research, development, application-engineering, plant supervision, trouble-shooting. Banbury mixing, milling, calendering, extruding. Positive record of achievement. Technical Service, Production, Research. Address Box 748-P, RUBBER AGE.

LATEX CHEMIST: M.S. Fifteen years experience compounding all rubber latices and rubber dispersions. Considerable sales service work. Some foamed latex experience. Desires position in production, development, or sales service with progressive company in Eastern area. Capable initiating and completing program. Executive ability. Address Box 749-P, RUBBER AGE.

**for MAXIMUM returns at minimum cost,**
**advertise in the Classified columns of**
**RUBBER AGE**

## HELP WANTED

RUBBER CHEMIST: Three to five years laboratory or factory experience sole and heel industry or mechanical goods. Send complete resume with salary desired. Address Box 703-W, RUBBER AGE.

SUPERINTENDENT-CHEMIST: Under forty, experienced with molded rubber parts. Excellent opportunity. Chicago area. Our men know of this ad. Address Box 734-W. RUBBER AGE.

CHEMIST, with knowledge of compounding rubber soles, heels, and mechanical goods, for New England plant. Reply giving full particulars. Address Box 739-W, RUBBER AGE.

CHIEF CHEMIST: Excellent opportunity for a man to be Chief Chemist of a mechanical rubber goods company in Western Pennsylvania. Must be aggressive and able to assume responsibility. Should be thoroughly familiar with all types of compounding, rubber-to-metal adhesions, factory operations, handling inquiries and organizing the work of a laboratory. Supply full particulars in first letter, including experience, training, references, and salary requirements. Recent snapshot desirable. Address Box 746-W, RUBBER AGE.

**CHEMIST OR CHEMICAL ENGINEER**
Experienced Latex Chemist to assume complete charge (as Production Chemist of Control Group) of well established progressive manufacturing concern in Latex Foam field. Responsible position for energetic person with liking for production work. Foam experience desirable but not essential. Salary commensurate with ability. Eastern location. Our staff has knowledge of this advertisement.
Address Box 752-W, RUBBER AGE

## BUSINESS OPPORTUNITIES

**We do Rubber Compounding, Light Color Stock Mixings, and GR-S Breakdown. FRANK T. BAKER RUBBER COMPANY, 63 Arch Street, Fall River, Massachusetts.**

**SELL NOW! BEFORE PRICES DROP FURTHER! Wanted: Chemicals, Colors, Pigments, Resins, Solvents, Oils, Waxes, Lacquers, Other Materials, Supplies, Equipment, etc. CHEMICAL SERVICE CORP., 84-04 Beaver St., New York 5, N. Y.**

**CUSTOM MILLING—Facilities available for mill mixing and dissolving. Large raw materials stock, new equipment, competent staff, laboratory control. RUBBER AND ASBESTOS CORPORATION, 225 Belleville Ave., Bloomfield, New Jersey. BLoomfield 2-1300, or REctor 2-6121.**

MANUFACTURER'S SALES REPRESENTATIVE

Many contacts in the rubber and plastic industries, New England states, New York, and New Jersey—seeks to represent machinery manufacturer—will sell on straight commission basis. Office downtown New York. Address Box 743-B, RUBBER AGE.

**✓ CHECK WITH US FOR Rubber and Plastic Scrap 40 YEARS EXPERIENCE**
**√ UNCURED COMPOUNDS √ RUBBER √ POLYETHYLENE √ VINYL (PVC)**
**ROTEX RUBBER COMPANY INC.**
**437 RIVERSIDE AVE., NEWARK 4, N. J. TELEPHONE: HUMBOLDT 2-8000**

## BUSINESS OPPORTUNITIES (Continued)


**CUSTOM MIXING**

We do milling and compounding of all types —blacks or colors—Master Batches. All mixing done under careful supervision and laboratory control.

*Phone: Butler 9-0400*

**Pequanoc Rubber Company Butler, N. J.**

**BLACK**

**Master Batching**
**Mixing of all kinds**

**BESTREAD PRODUCTS CO. STOUGHTON, MASS.**


MANUFACTURERS ATTENTION

Capable, aggressive sales representative, thoroughly experienced in the manufacture and sales of mechanical and sponge rubber products, desires a line of merit on an exclusive basis, for representation in New York and New Jersey areas. Office and warehouse facilities are available. Address Box 750-B, RUBBER AGE.


VULCANIZER DOOR GASKETS
For Breech Lock Type Quick Opening Vulcanizer Doors
A Quality Product Made in Special Molds
Used for Years by Leading Manufacturers
Sizes 20" to 96" in Stock for Prompt Shipment
L. M. WISE EQUIPMENT COMPANY
P. O. Box 3566, Akron 10, Ohio


CHICAGO, newly organized Sales Agency will represent manufacturer in this area, including 150 mile radius. Sales, promotions and personal representation as your own organization, or agent, as desired. Address Box 751-B, RUBBER AGE.

**AGENCY WANTED**

**New England area—experience and contacts—exclusive basis**

**Address Box 753-B, RUBBER AGE**

## EQUIPMENT WANTED

WANTED: Complete rubber plants. Also individual items such as: 2-roll mills, calenders, mixers and Banbury Mixers. R. GELB & SONS, INC., State Highway No. 29, Union, New Jersey.

WANTED: 500 to 600 gallon double spiral Ribbon Mixer. Jacketed for 25# pressure. Suitable for making stiff pastes. End or bottom gate discharge, gear or chain drive, welded construction. Address Box 741-E, RUBBER AGE.

**WANTED: #9 and #11 Banbury Mixers. 60" and 84" Rubber Mills. Lab Mill #3 & #4. Royle Extruders #3 & #4. Send complete details. Address Box 742-E, RUBBER AGE.**

**WANTED: Laboratory Tuber, Royal #0 or #00. State price, condition and type of drive. Address Box 744-E, RUBBER AGE.**

WANTED: Scott Tester, model LP or XL, with a single or double 75 lbs. capacity. ROYAL ELECTRIC COMPANY, INC., Pawtucket, Rhode Island.


**STEEL CALENDER STOCK SHELLS**

ALL STEEL, ALL WELDED CONSTRUCTION, with forged steel hubs for 1¼", 1½" and 2" square bars.

4", 5", 6", 8", 10", 12", 15", 20" and 24" diameters. Any length.

Also Special Trucks (Leaf Type) Racks, Tables and Jigs.

Used in manufacturing rubber and plastic products.

**THE W. F. GAMMETER COMPANY**
CADIZ, OHIO

**GRANULATED CORK**

*Southland Cork Company* | *P. O. Box 868 Norfolk 1, Va.*

SINCE 1880 RUBBER GOODS

Rand. REG. U.S. PAT. OFF.

"They Last Longer" REG. U. S. PAT. OFF.

DRESS SHIELDS
DRESS SHIELD LININGS
BABY PANTS
BABY BIBS & APRONS
SANITARY WEAR
RUBBERIZED SHEETING
RUBBER APRONS
STOCKINET SHEETS
RUBBER SHEETS
RAINCAPES & COATS
RUBBER SPECIALTIES
DOLL PANTS, CAPES, ETC.
RUBBER DAM & BANDAGES — SHEET GUM

RAND RUBBER CO. BROOKLYN, N. Y. U. S. A. MFRS.

**JOHNSON HOSE REINFORCEMENT WIRE**

**High tensile liquor finish hose reinforcement wire for high pressure hydraulic hose of wire braided type. Prompt shipment.**

**JOHNSON STEEL & WIRE COMPANY, INC.**
**Worcester 1, Massachusetts**

**HOWE MACHINERY CO., INC.**

30 Gregory Avenue Passaic, N. J.

DESIGNERS & BUILDERS
OF V BELT MANUFACTURING EQUIPMENT

Cord Latexing, expanding mandrels, automatic cutting, skiving, flipping and roll drive wrapping machines

ENGINEERING FACILITIES FOR SPECIAL EQUIPMENT

Call or Write

**RUBBER LACQUERS**

Clear and Colored

THE NATIONAL CHEMICAL & PLASTICS CO.
1424 Philpot St. Baltimore 31, Md.

**NEW and REBUILT MACHINERY**

SINCE 1891

**L. ALBERT & SON**

**Trenton, N. J. Akron, O. Chicago, Ill. Los Angeles, Calif. Stoughton, Mass.**

For Your

# RUBBER MACHINERY

Buys of the month.....

**MILLS**

22" x 60"
16" x 48"
16" x 40"
10" x 24"

**CALENDERS**

28" x 78"
24" x 66"
24" x 60"
18" x 48"
16 x 42—5-roll
12 x 30
5 x 14—4-roll

**PRESSES**

24 x 120—3-22" rams
24 x 24—18" rams (new)

**BANBURY MIXERS**

2 — #9's complete with all equipment including 250 hp motor, controls, enclosed herringbone reduction drive, etc. We are completely reconditioning these units and they will be guaranteed in excellent condition throughout.
Also #3A, #1A & #00

**VULCANIZERS**

3-84" dia. x 15' long, with quick opening doors, 125 lb. p.s.i. complete.
Also new all-steel Vulcanizers—any dia. and length.

**EXTRUDERS**

1", 2½", 3¼", 4½", 6" & new National Rubber 8"
1-32" x 100" Roll Grinder

In addition to the above we have available any and all machinery necessary for the processing of rubber

**AKRON RUBBER MACHINERY CO.**

P.O. Box 88 Phone WAlbridge 1183-4 Akron, O.



IOI

*Engineered Application of Heat in Continuous Materials Handling Systems*

**INDUSTRIAL OVENS, INC.**

13825 TRISKETT ROAD, CLEVELAND 11, OHIO



**GRANULATED CORK**

PROCESSED TO SPECIFICATION

MARYLAND CORK COMPANY, INC.

1528 Munsey Bldg. Baltimore 2, Md.



*Reanite* THE BETTER RUBBER-TO-METAL BOND

THE U. S. STONEWARE CO.

AKRON 9, OHIO


## EQUIPMENT FOR SALE

SAVE WITH GUARANTEED REBUILT EQUIPMENT—Hydraulic Presses: 24" x 24", 18" ram, 318 tons; 24" x 56", 450 tons, multiple opening; 24" x 24", 16" ram, 250 tons; 24" x 24", 12" ram, 170 tons; 24" x 42", 2—12" rams, 340 tons; 42" x 42", 16" ram, 250 tons; 36" x 36", 12" ram, 141 tons; 20" x 18", 10" ram, 118 tons; 20" x 20", 10" ram, 118 tons; 19" x 24", 10" ram, 78 tons; 22" x 15", 8" ram, 75 tons; 27" x 21", 8" ram, 75 tons; 15" x 15", 8" ram, 75 tons; 12" x 12", 7½" ram, 60 tons; 12" x 12", 6½" ram, 50 tons; 8" x 9½", 4½" ram, 20 tons; 16" x 16", 3½" ram, 12 tons. Laboratory Presses: 10 ton Carver, 6" x 6"; 30 ton Watson-Stillman, 6" x 6". Laboratory Mills and Calenders: (New) M.D.; Thropp Mill, 16" x 40" M.D. New Dual Pumping Units, all sizes. Extruders: Royle Rubber #2; Royle Plastic #1. Preform Presses: Stokes T; Colton 5½T; Stokes DDS4 with Reeves Drives. Also Mixers, Vulcanizers, Accumulators, etc. UNIVERSAL HYDRAULIC MACHINERY COMPANY, 285 Hudson Street, New York 13, N. Y.

**FOR SALE: Banbury Mixers, Mills, Calenders, Laboratory Mill and Banbury Unit, Extruders, Tubers, Hydraulic Presses. Send for detailed bulletin. EAGLE INDUSTRIES, INC., 110 Washington Street, New York 6, N. Y. DIgby 4-8364-5-6.**

FOR SALE: Hydraulic Pump, used only few months. 87 GPM 400 pound low pressure 5 to 1 booster with two Vickers pumps and Racine booster. Complete with 20 hp motor 220/440, 60 gallon oil storage under pump. RADIATOR SPECIALTY CO., 1700 Dowd Rd., Charlotte, N.C.

**SPECIAL: Three Thropp 20" x 20" x 60" Mills, two complete with drives and 125 hp explosion proof motors, one with drive, no motor. Price right for quick removal from present foundation. Also Tubers, Vulcanizers, Hydraulic Presses, Calenders, etc. Send us your inquiries. CONSOLIDATED PRODUCTS CO., INC., 14-19 Park Row, New York 7, N. Y. Phone BArclay 7-0600.**

FOR SALE: 3 C Abbe pebble mill, new; M Abbe Laboratory pebble mill; 80 gallon steam stainless steel mixing kettle. RYAN RUBBER CO., 2401 South Ervay St., Dallas 1, Texas.


**NATIONAL SHERARDIZING & MACHINE CO.**

**AIR BAG BUFFING MACHINERY**
**STOCK SHELLS HOSE POLES MANDRELS**

858 Windsor St., Hartford, Conn.

Representatives: Akron New York


## Directory of CONSULTANTS

**FREDERICK S. BACON LABORATORIES**
Consultation, Research, Product Development, Formulas, Chemical and Physical Testing on Rubber and Plastics.
192 Pleasant Street, Watertown 72, Massachusetts
Phone: Watertown 4-5000

**PHILIP TUCKER GIDLEY**
Consulting Technologist—Research, product development, formulas, factory plans, engineering, chemical and physical testing.
Fairhaven, Massachusetts

**R. R. OLIN LABORATORIES**
Rubber Technologist—Development and research in Natural Rubber, Synthetic Rubber and Plastics. Also chemicals and compounding materials used with these materials.
PO Box 372 RA, Akron 9, Ohio

**SOUTH FLORIDA TEST SERVICE**
*(Established 1931)*
Corrosion, weathering and sunlight tests. Four locations in Southern Florida for inland, salt atmospheric, tidewater and total immersion exposure tests.
4201 N. W. 7th St., Miami, Florida


FLEXO JOINTS

THE STANDARD FOR SAFETY

- Proved in years of efficient service, FLEXO JOINTS offer the flexibility of hose — the strength of pipe — the ideal steam connection for presses, tire molds, etc.
Four styles, for standard pipe sizes ¼" to 3".
- Write for information and prices.

FLEXO SUPPLY CO., INC., 4662 Page Blvd., St. Louis 13, Mo. *In Canada:* S. A. ARMSTRONG, LTD. 1400 O'Connor Dr., Toronto 13, Ont.

# INDEX TO ADVERTISERS


A

A-C Supply Co. — Adamson United Co. — Akron Equipment Co. — Akron Rubber Machinery Co. 502 — Albert, L., & Son 501 — Alco Oil & Chemical Corp. 493 — All Steel Welded Truck Co. 497 — American Cyanamid Co. Calco Chemical Div. 393 — Industrial Chemicals Division — — American Machine & Foundry Co. 392 — American Zinc Sales Co. 397 — Atlas Electric Devices Co. 476

B

Bacon, Frederick S., Laboratories 502 — Baird Rubber and Trading Co. — — Baker & Adamson Products, General Chemical Div., Allied Chemical & Dye Corp. 417 — Baker, J. T., Chemical Co. 401 — Barrett Div., Allied Chemical & Dye Corp. 388 — Beacon Co. — — Bestread Products Co. 501 — Binney & Smith Co. 480 & Insert Following 454 — Black Rock Mfg. Co. — — Boiling, Stewart, & Company, Inc. — — Bonwitt, Eric — — Bridgewater Machine Co., Athens Machine Div. — — Brockton Cutting Die & Machine Co. — — Brooklyn Color Works, Inc. 499 — Brown Company — —

C

Cabot, Godfrey L., Inc. 405 — Cambridge Instrument Co. — — Cameron Machine Co. — — Carey, Philip, Mfg. Co. — — Carter Bell Mfg. Co. 487 — Chemical & Pigment Div., Glidden Co. 409 — CLASSIFIED ADVERTISING 500, 501, 502 — Cleveland Liner & Mfg. Co. 396 — Colledge, E. W., General Sales Agent, Inc. 493 — Columbian Carbon Co. 480 & Insert Following 454 — Concord Mica Corp. 503 — CONSULTANTS SECTION 502 — Continental Carbon Co. 412 — Cooke Color & Chemical Co. 384 — Coulter, James, Machinery Co. 478

D

Deecy Products Co. 488 — Diamond Alkali Company Pure Calcium Prod. Div. — — Dow Corning Corp. 425 — du Pont de Nemours, E. I., & Co., Inc. Organic Chemicals Department — — Rubber Chemicals Div. Second Cover

E

Emerson Apparatus Co. 483 — English Mica Co. 499 — Enjay Company, Inc. 477 — Erie Engine & Mfg. Co. 410

F

Falls Engineering & Machine Co. — — Farrel-Birmingham Co., Inc. 418, 419 — Fawick Airflex Co., Inc. — — Federal Products Corp. — — Ferry Machine Co. — — Flexo Supply Co., Inc. 502 — Foremost Machine Builders, Inc. — — Foxboro Company — —

G

Gammeter, W. F., Co. 501 — General Atlas Carbon Co. 423 — General Chemical Division, Allied Chemical & Dye Corp. 417 — General Electric Co. Apparatus Dept. — — Chemical Dept. — — General Latex & Chemical Corp. — — General Magnesite & Magnesia Co. 489 — Geneske Brothers 422 — Georgia Marble Co., Calcium Products Div. 481 — Gidley, Philip Tucker 502 — Glidden Co., Chemical & Pigment Div. 409 — Goodrich, B. F., Chemical Co. (Chemical) — — Goodrich, B. F., Chemical Co. (Hycar) 381 — Goodyear Tire & Rubber Co. (Chemical Div.) 383, 387

H

Hall, C. P., Co. 414 — Hardman, H. V., Co., Inc. 491 — Harwick Standard Chemical Co. Back Cover — Heveatex Corporation 495 — Hoggson & Pettis Mfg. Co. — — Holliston Mills, Inc. — — Howe Machinery Co., Inc. 501 — Huber, J. M., Corp. 428

I

Indoil Chemical Co. 403 — Industrial Ovens, Inc. 502 — Institution of the Rubber Industry 486 — Interstate Welding Service 424

J

Johnson Steel & Wire Co., Inc. 501

K

Koppers Co., Inc., Chemical Div. 408

L

Lambert, E. P., Co. 493 — Littlejohn & Co., Inc. —

M

Magnetic Pigment Div., Columbian Carbon Co. 480 — Magnolia Metal Co — — Marbon Corp. — — Marine Magnesium Products Corp. — — Maryland Cork Co. 502 — McNeil Machine & Engineering Co. 416 — Monsanto Chemical Co. 399 — Mt. Vernon-Woodberry Mills, Inc. 407 — Muehlstein, H., & Co., Inc. 475 — Murray, D. J., Mfg. Co. —

N

National-Erie Corp. 485 — National Chemical & Plastics Co. 501 — National Lead Co. 420 — National Rosin Oil Products, Inc. 499 — National Rubber Machinery Co. 479 — National Sherardizing & Machine Co. 502 — National-Standard Co. 427 — Naugatuck Chemical, U. S. Rubber Co. 385, 430 — Neville Co. 395 — New Jersey Zinc Co. 413

O

Olin, R. R., Laboratories 502

P

Pan American Chemicals Div., Pan American Refining Corp. 497 — Pennsylvania Industrial Chemical Corp. — — Pequanoc Rubber Co. 501 — Phillips Chemical Co. 382 — Pioneer Products, Inc. — — Pittsburgh Plate Glass Co., Columbia Chemical Div. —

R

Rand Rubber Co. 501 — Randall, Frank E., Co. 485 — Rare Metal Products Co. 499 — Revue Generale Du Caoutchouc — — Richardson, Sid, Carbon Co. 504 — Rotex Rubber Company, Inc. 500 — Royle, John, & Sons 489 — Rubber Corp. of America, Latex Div. 488

S

St. Joseph Lead Co. 404 — Schulman, A., Inc. Inside Back Cover — Scott Testers, Inc. — — Sharples Chemicals Inc. — — Shaw, Francis, & Co., Ltd. — — Siempelkamp, G., & Co., Maschinenfabrik 491 — Simplex Cloth Cutting Machine Co., Inc. — — Sivon Machine Co. 482 — Skelly Oil Co., Solvents Div. — — South Asia Corp. 493 — South Florida Test Service 502 — Southeastern Clay Co. — — Southern Clays, Inc. 402 — Southland Cork Co. 501 — Spadone Machine Co. — — Stamford Rubber Supply Co. 495 — Standard Machinery Co. 483 — Stanley Chemical Co. — — Stanley Electric Tool Div. — — Stauffer Chemical Co. — — Stein, Hall & Co., Inc. — — Stoner's Ink Co. 503 — Sun Oil Co. 411

T

Tanney-Costello, Inc. 484 — Taylor Instrument Companies 386 — Thropp, Wm. R., & Sons 482 — Titanium Pigment Corp. 400 — Trade News Service — — Tumpeer Chemical Co. 489 — Turner Halsey Co. 407

U

United Carbon Co. Insert Following 388 — United Engineering & Foundry Co. 415 — United Rubber Machinery Exchange 499 — U. S. Rubber Reclaiming Co. 394 — U. S. Stoneware Co. 502 — Utility Mfg. Co. 483

V

Vanderbilt, R. T., Co. Front Cover

W

Williams, C. K., & Co. 391 — Wills Rubber Trimming Machine Co. — — Wilson, Charles T., Co., Inc. 499 — Wilco Chemical Co. 412 — Wood, R. D., Co. 421 — Wyandotte Chemicals Corp. 491



## MOLD LUBRICANT NO. 769

is our latest development. Mold Lubricant #769 differs from Mold Lubricant #735 in that it is less oily and has a lower pH.

**Mold Lubricant #735—pH 10.**
**Mold Lubricant #769—pH 7.9**

Some of Mold Lubricant #735 is now being used in practically every rubber company in the world. This is a record in itself. For some release jobs, we believe #769 is better.

**Mold Lubricants #735 and #769 are not emulsions. You get perfect mixture with hard or soft water or alcohol, and there is no separation on standing. This insures perfect lubrication on all types of molds.**

***Try a sample of our Mold Lubricants #735 and #769 and cure your troubles***

**STONER'S INK COMPANY**
**QUARRYVILLE, PENNA.**

## *MICA* WATER-GROUND "At Its Best"

**Every rubber manufacturer using Water-Ground Mica should be using "CONCORD" because:**

1—It is ground exclusively from a clean, white Muscovite Mica scrap imported from India and Africa.
2—It is whiter and purer.
3—It is strictly competitive in price.

***Send for samples and prices***

**CONCORD MICA CORPORATION**
27 Crescent Street — Penacook, N. H.

# working together—

A profitable *team* is working for you when you depend upon economical-to-use ***TEXAS "E"*** or ***TEXAS "M"*** Channel Blacks. It's a team that makes possible lower production costs as well as high quality finished products.

The *uniformity* of Sid Richardson Carbon Company channel blacks makes them easy and economical to use. This uniformity is assured because our blacks come from a single source—the world's largest channel black plant, where *highest quality* is the only acceptable standard.

Our own complete facilities and nearby natural resources back up our guarantee of a continuing supply for your future, as well as your present needs.

Let us serve you.

TEXAS CHANNEL BLACKS

**Sid Richardson**
**CARBON CO.**
**FORT WORTH, TEXAS**

GENERAL SALES OFFICES
EVANS SAVINGS AND LOAN BUILDING
AKRON 8, OHIO

# KEEP CALLING your nearest SCHULMAN office for HARD RUBBER DUST

As quick as you buzz your secretary — you can put your hands on the special quality Hard Rubber Dust you require.

Our 16 years of manufacturing experience makes us well acquainted with intricate and special operations. With dusts for every purpose (ranging between an ash of less than 1% and a gravity of 1.17 to an ash content of 55% and a gravity of 1.50). We have 82 types of dust uniformly made to meet most exacting needs. Your specific requirement for proper mesh can be supplied from 100% through 120 mesh down to 100% through 40 mesh. Another Schulman service is the careful custom grinding of your hard rubber. Your nearest Schulman office is ready to serve you promptly. Ask your secretary to "FIRST CALL SCHULMAN" for full particulars, samples and quotations.

AKRON HEmlock 4124

NEW YORK LOngacre 4-5960

BOSTON LIberty 2-2717

EAST ST. LOUIS BRidge 5326

HUNTINGTON PARK LAfayette 5833

## A. Schulman Inc.

*Rubber and Plastics*

MAIN OFFICE AND PLANT 790 E. TALLMADGE AVE., AKRON 9, OHIO

AKRON, OHIO • NEW YORK CITY • BOSTON, MASS. • JERSEY CITY, N. J.
E. ST. LOUIS, ILL. • HUNTINGTON PARK, CALIF.

**NEW YORK CITY** 500 Fifth Ave. • **AKRON, O.** 790 E. Tallmadge • **BOSTON, MASS.** 738 Statler Bldg. • **E. ST. LOUIS, ILL.** 14th & Converse • **HUNTINGTON PARK, CALIF.** Room 209, Vincent Bldg., 6308 Pacific Blvd.

# NOW "ChamPak" -a Unit Pack without a Pallet!

• It's a new idea that *saves* . . . It's another CHAMPION, too, for cutting handling costs without the expense of a pallet . . . A ton-and-a-half unit load of inter-locked bags—packed as a unit in the car, moved as a unit into your stock room . . . And every bag filled with superior, light-colored, uniform CHAMPION CLAY ready to use . . . Let us tell you more about this remarkable SAVING development by CHAMPION.

**YOU'RE ALWAYS AHEAD WITH**

*Champion*

• Champion Clay is manufactured and packed by the National Kaolin Products Co., Aiken, S. C.

HARWICK STANDARD CHEMICAL CO.

AKRON OHIO

BRANCHES: BOSTON, TRENTON, CHICAGO, LOS ANGELES